The Beagle, Records of the Northern Territory Museum of Arts and Sciences, 1992 **9**(1):143-172

A PLEISTOCENE MARSUPIAL FAUNA FROM LIMEBURNER'S POINT, VICTORIA, AUSTRALIA.

WILLIAM D. TURNBULL[1], ERNEST L. LUNDELIUS, JR.[2] AND RICHARD H. TEDFORD[3]

[1]*Department of Geology, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605-7909, USA.*
[2]*Department of Geological Sciences, The University of Texas at Austin, P.O. Box 7909, Austin, Texas 78713-7909, USA.*
[3]*Department of Vertebrate Paleontology, American Museum of Natural History, Central Park West at 79th St, New York, New York 10024-5192, USA.*

ABSTRACT

A collection of fossil marsupials, recovered from freshwater limestones at Limeburner's Point near Geelong, Victoria, Australia, is described. The fauna, here named the Limeburner's Point Local Fauna, contains two species of *Sarcophilus* Boitard, one near *S. harrisii* (Boitard) and *S. laniarius* (Owen), and another large species; a large vombatid near *Lasiorhinus medius* (Owen); a new species of *Simosthenurus* Tedford, *S. mccoyi*, intermediate in size between *S. orientalis* (Tedford) and *S. pales* (De Vis); two wallabies, one near *Macropus* (*Notomacropus*) *parryi* Bennett, the other cf. *Wallabia bicolor* (Desmarest); a large indeterminate macropod; two diprotodontids, *Diprotodon* "*longiceps*" McCoy that is here referred to *D. optatum* Owen; and an indeterminate species of *Zygomaturus* Macleay. Most of these taxa belong to extinct lineages. The faunal assemblage indicates a mid-Pleistocene age which is in accordance with recent conclusions based on magnetic polarity stratigraphic analysis and earlier stratigraphic correlations.

KEYWORDS: Limeburner's Point Local Fauna, Geelong, Victoria, Pleistocene marsupials.

INTRODUCTION

Limeburner's Point, formerly known as Point Galena, is located on the east edge of Geelong, Victoria, Australia (38° 10' S, 144° 23' E) (Fig. 1). Approximately 50 specimens, registered in the collections of the Museum of Victoria, are designated the Limeburner's Point Local Fauna. This material was collected over a period of years from the mid 19th to early 20th century when the lime kilns were active. McCoy (1876), Keble (1945) and most recently Whitelaw (1991; in press) have mentioned the fauna or various elements of it. No prior systematic treatment has been given although Gill (1964) referred to the *Diprotodon* "*longiceps*" Mc Coy specimen in a paper in the Basalt Plains Symposium.

The dental enumeration follows Archer (1978). Abbreviations used in the text are: LBP, Limeburners Point; AMNH, American Museum of Natural History; AM, Australian Museum; BMNH, British Museum Natural History; FMNH, Field Museum of Natural History; NMV, Museum of Victoria; QM, Queensland Museum; TMM, Texas Memorial Museum; UT, University of Texas.

STRATIGRAPHY AND AGE

The limestone and associated deposits at this locality were first recorded by Daintree (1863, *fide* Keble 1945) in his report on the survey of Quarter Sheet 24 S. E. where it was called Galena Point. Located on the south side of the Inner Harbour of Corio Bay, a western arm of Port Philip Bay, Galena Point rises rather steeply from the sea to about 21 m (70 feet). Keble quotes from the Daintree report:

"The section afforded in the thickest part of the limestone deposit at Limeburner's Point is:

7 feet	Marly clay	Marine shells
10 feet	Ferruginous sandy clay with marine shells	
3 feet 6 inches	Rubbly limestone	Freshwater shells, *Planorbis*, *Lymnea*, etc."
3 feet 6 inches	Thin bedded lime-stone	
7 feet	very compact limestone principal bed used for lime	
6 feet	Rubbly thin-bedded ferruginous-limestone resting on Miocene tertiary marl	

At this point Keble, without closing the quote, adds the comment: "This closely agrees with Note 3 printed on the margin of the sheet." He then goes on to state: "It will be noted that the freshwater shells are identical with those obtained in the well (p. 30) in the Duck Ponds limestone." He continues: "at Limeburner's Point *Diprotodon longiceps* was obtained in situ in the 7 foot bed of 'very compact limestone'". Both McCoy (1876) and Pritchard (1895) had previously mentioned the *D. longiceps* specimen.

McCoy (1876) apparently, and Keble (1945) certainly, assumed that the *Diprotodon longiceps* specimen in the Duck Ponds Local Fauna came from the Lara Limestone unit contained within the stratigraphic section at the nearby Duck Ponds site. The Lara and Limeburner's Point limestones have long been considered equivalent, either as extensions of the same limestone (Lara), or as independent, but time equivalent, deposits. The presence of *D. longiceps* recovered in situ at Limeburner's Point doubtless reinforced that assumption. However Wilkinson (1972) has demonstrated conclusively that while the two limestones are indeed laterally equivalent deposits, at Duck Ponds, the *D. longiceps* material came not from the limestone itself, but from the underlying fluviatile sediments.

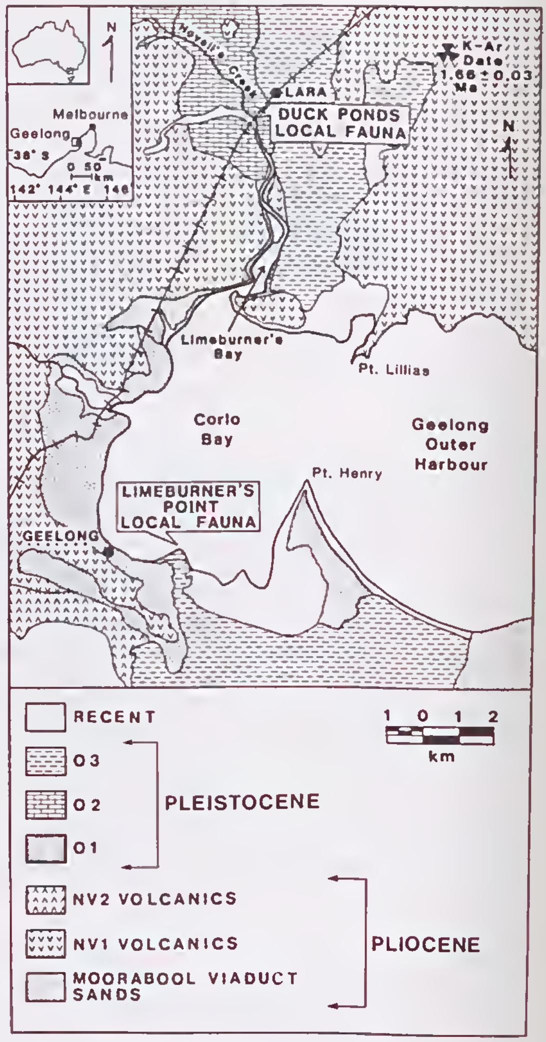

Fig. 1. Geological map showing the location of Limeburners's Point near Geelong, Victoria, the source of the Limeburner's Point Local Fauna. Map courtesy of M. J. Whitelaw and by permission of *Quaternary Research*.

Recent studies by Whitelaw (1991; in press) of the magnetic stratigraphy of the Limeburner's Point section has clarified the age relationships of this sequence and its correlates at the Duck Ponds site. Stratigraphic data show that the sediments containing the Duck Ponds Local Fauna lie above a basalt that has been correlated with one 7 km ENE, dated at 1.66 Ma (Wilkinson 1972; Aziz-ur-Rahman and McDougal 1972; Woodburne *et al.* 1985). This basalt has reversed polarity indicating that it is younger than the normal Olduvai Subchron (1.86-1.66 Ma) and within the younger part of the Matuyama Chron. The Limeburner's Point sediments are also younger than 1.66 Ma and because they have normal magnetic polarity, they must fall into one of the normal magnetic chrons younger than 1.66 Ma, either the Jaramillo Subchron of the Matuyama Chron (0.98-0.91 Ma) or the Brunhes Chron (0.73-0 Ma). The sediments containing the Duck Ponds Local Fauna lie below the Lara limestone correlative with the fossiliferous limestone at Limeburner's Point and hence are older than the latter, but are unconstrained by magnetostratigraphy.

The preservation of the specimens from the thin-bedded or compact Limeburner's Point limestone is good. Some of the specimens were in partial articulation (NMV P-23267-70, 23274, 23276 and 23285) but most were isolated pieces. Evidence from bone fragments and tooth chips suggests preburial breakage, possibly from trampling (NMV P-23252, 23267-70, 23285). Those specimens from the rubbly limestone units show the same solution destruction seen in the Coimadai material reported by Turnbull *et al.* (1990). In one case the bone was dissolved away leaving a natural mold. This was filled with epoxy providing a cast that was identified as a crushed, obliquely distorted, distal portion of a ?macropodid femur, comparable in size to one of the living large kangaroos. One specimen is unique in being partially enveloped in calcite crystals and a black mineral that appears to be manganese oxide. The latter material also occurs as irregular blebs within the otherwise dense limestone matrix.

SYSTEMATIC PALEONTOLOGY

Class Mammalia
Subclass Theria
Infraclass Metatheria (Marsupialia)
Order Marsupicarnivora
Family Dasyuridae
***Sarcophilus* sp. 1**
[near *S. harrisii* (Boitard, 1842) and *S. laniarius* (Owen, 1838)].
(Figs 2-3; Tables 1-2)

Material. NMV P 23236-7, a left ramus with P_{2-3}, M_{2-5}.

Description. This specimen is clearly assignable to *Sarcophilus* Cuvier but specific assignment is less certain. The mandible of the LBP specimen differs from that of the living species, *S. harrisii*, in that the horizontal ramus is slightly deeper (about 2.5 cm beneath M_{4-5} compared to about 2 cm for the living species; n=2) and the masseteric fossa is deeper and more open. The ridges defining the fossa anteriorly and ventrally form an angle of about 80° in the fossil compared to an angle of about 65° in the living form. The ascending ramus appears to be more upright and massive than in the living species. The flange that defines the ventral margin of the masseteric fossa is thicker in the fossil. The anteroposterior length of the ascending ramus taken slightly above the top of the condyle in *S. harrisii* is 2.08 cm (average of four FMNH specimens). The equivalent dimension of the LBP specimen is 2.6 cm. Although it is broken, it is clear that the coronoid process was higher in the fossil. Hence both the masseter and the temporalis portions of the masticatory musculature are proportionately more massive than in the modern species, and the insertion fields are more sharply defined.

The two lower premolars are crowded so that the anterior end of the P_2 and its anterior root labially overlap the posterior end and root of P_1. Both premolars are blunt, each consisting essentially of a swollen principal cusp fused with a broad and low "talonid" as in *S. harrisii*. The size relationships of the molars are $M_2 < M_3 < M_4 <= M_5$. All have the protoconid as the largest cusp. The paraconid is absent on M_2, small and almost joined to the protoconid in M_3 and is large in M_{4-5}. The latter two teeth have a well developed carnassial notch between the protoconid and paraconid. All molars possess hypoconids, grading from the largest on the M_2 to a vestige on M_5. The metaconids are small on all molars.

Discussion. Dental measurements of both LBP *Sarcophilus* species and other fossil species are given in Table 1; measurements of Recent *S. harrisii* are given in Table 2. The metric data and the bivariate scatter diagrams of premolars (length vs. width) and molars (length vs. anterior or posterior width) show the intermediate position of the LBP specimen of *Sarcophilus* sp. 1 between *S. harrisii* and *S. laniarius* (Fig. 3). This is particularly true for M_4 and M_5 in which the samples of *S. harrisii* and late Pleistocene *S. laniarius* show no overlap. In the case of M_2 and M_3, in which the clouds of points of the two samples overlap slightly or almost overlap, the fossil lies close to the mean of the *S. harrisii* sample. For the M_2 and P_2 where there is some or extensive overlap of the clouds, the fossil is also

Table 1. Measurements (mm) of fossil specimens of *Sarcophilus*: **al** = alveolar; **u** = unerupted; **w** = worn.

		Sarcophilus laniarius				*Sarcophilus* sp.	
		Topotype (Stirton, 1957)	Wellington Caves (Dawson, 1982)			LBP NMV 23236-7 Species 1	LBP NMV 23240 Species 2
			N	Range	Mean	Left	Right
P_1	L	-	-	-	-	7.13	al >8.8
	W	-	-	-	-	4.68	-
P_2	L	-	17	6.3 - 7.8	7.0	7.19	al >9.1
	W	-	17	5.8 - 6.8	6.3	5.75	-
M_2	L	10.6	52	8.9 - 11.2	9.9	9.14	al >10.6
	W	7.1	51	6.0 - 8.0	6.9	-	-
	AW	-	-	-	-	6.03	-
	PW	-	-	-	-	6.15	-
M_3	L	-	56	10.6 - 12.5	11.6	~10.26	12.2
	W	-	54	6.5 - 8.0	7.2	-	-
	AW	-	-	-	-	~6.55	8.6
	PW	-	-	-	-	~6.75	8.4
M_4	L	-	49	12.5 - 15.0	13.9	~11.95	al >14.4
	W	-	50	6.5 - 8.3	7.4	-	-
	AW	-	-	-	-	~7.55	-
	PW	-	-	-	-	~6.85	-
M_5	L	15.0	33	12.7 - 15.1	13.9	>12.05	ant r >8.1
	W	8.2	32	7.0 - 8.5	7.8	-	-
	AW	-	-	-	-	~7.20	-
	PW	-	-	-	-	~6.25	-
Length anterior edge I_1 to posterior end M_5		72.5	-	-	-	>68.00	-
Length anterior edge P_1 to posterior end M_5		-	-	-	-	57.60	>60.8
Length molar series		49.4	-	-	-	44.20	45.4
Length between C and M_2		13.8	-	-	-	~14.50	~13.5
Height of Prd of M_5		15.2	-	-	-	10.20	-
Mandible depth below P_2		23.7	-	-	-	18.10	>24.0
Mandible depth below M_5		28.6	-	-	-	25.00	~20.0
Mandible thickness below M_5		12.5	-	-	-	11.80	11.7

near the mean of *S. harrisii*. In all scatter diagrams the fossil is larger than the mean of *S. harrisii* in at least one dimension.

Sarcophilus sp. 2.
(Figs 4-5; Table 1)

Material. NMV P 23240. A right ramus fragment with M_3, roots of C-P_1 and anterior root of P_2, and the alveoli of the rest of the cheek teeth. This specimen represents a new species, but is not formally named here until the discovery of better material.

Description. The canine root is stout, oval in outline, slightly constricted lingually and is set vertically in the jaw. It measures 12.3 x 8.7mm. at the broken surface which is located just below the gumline. The two doublerooted premolars show the same crowding and en echelon arrangement seen in *S. laniarius* and *S. harrisii*. The M_2

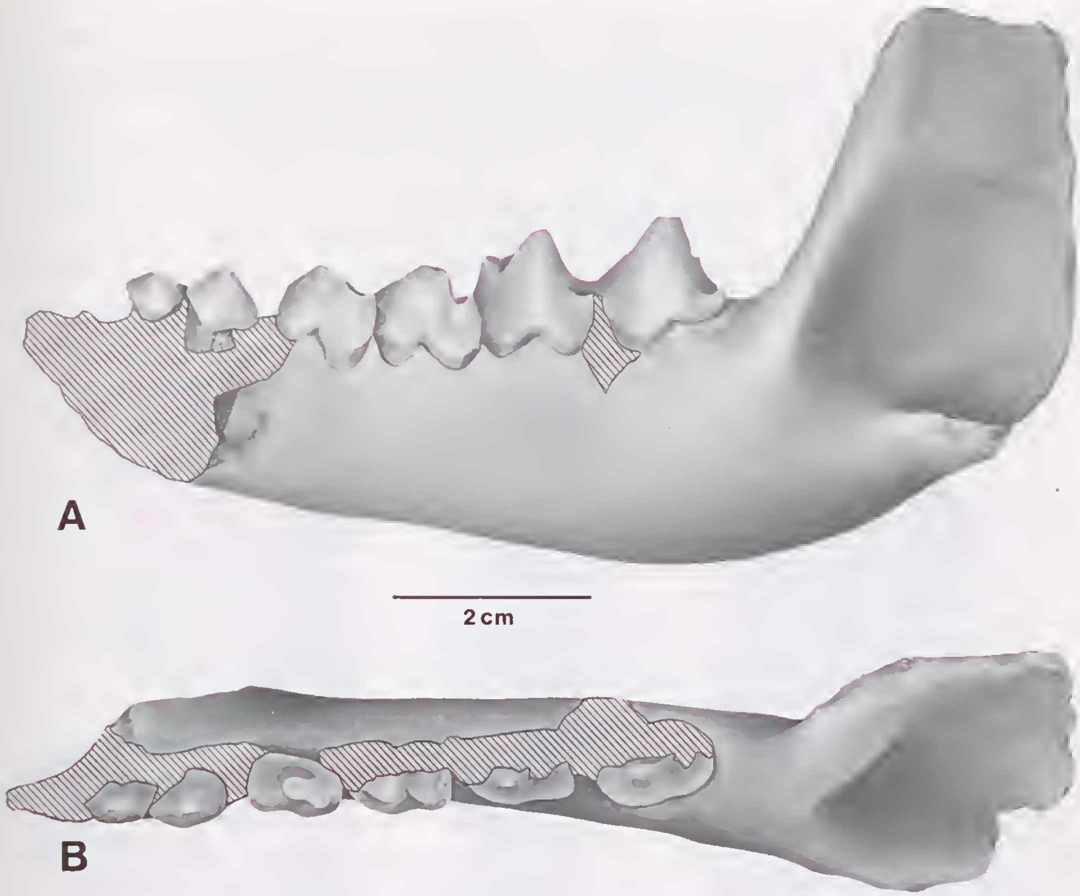

Fig. 2. *Sarcophilus* sp. 1 (near *S. laniarius* and *S. harrisii*) NMV P 23236-7, left mandibular ramus, shown in **A**, labial; and **B**, dorsal views.

appears to have been nearly equal in size and general proportions to the M_3, judging from the alveoli and roots.

The M_3 is a stout, relatively broad tooth that is heavily worn. The protoconid is the dominant cusp. It is deeply truncated by wear. The paraconid is small, and has suffered minor damage to its lingual side. The hypoconid is low and stout, the metaconid small. Both cusps are worn. There is a small anterior cingulum that extends both lingually and labially from a small cuspid at its center, its highest point.

A minute dentine fragment located at the deeply abraded dorsal edge of the jaw at the rear of the tooth row appears to be the posterior root of M_5. It is located 11 mm behind the back edge of the anterior root of M_5. It lacks enamel and has what appears to be a pulp cavity perforation in its center. An X-ray of the specimen (Fig. 5) shows the roots and alveoli as indicated. If the questioned tooth fragment is the tip of the posterior root of M_5 (arrow on the X-ray), it indicates a

Table 2. Measurements (mm) of modern *Sarcophilus harrisii*: * = maximum width.

		FMNH Recent Mammal Collection			Bartholomai and Marshall (1973)		
		N	Range	Mean	N	Range	Mean
P_1	L	5	6.54 - 7.02	6.77	27	6.5 - 7.4	6.93
	W	5	4.31 - 4.71	4.48	27	4.0 - 5.0	4.50
P_2	L	5	6.68 - 6.99	6.89	27	6.5 - 7.6	7.19
	W	5	5.05 - 5.74	5.37	27	5.1 - 6.0	5.66
M_2	L	5	8.51 - 9.32	8.83	27	8.3 - 9.3	9.00
	W*	-	-	-	27	6.0 - 7.0	6.31
	AW	5	6.16 - 6.38	6.24	-	-	-
	PW	5	5.94 -10.53	10.28	27	10.0 -10.6	10.19
	W*	-	-	-	27	6.2 - 7.3	6.64
	AW	5	6.26 - 6.97	6.74	-	-	-
M_4	L	5	11.66 -12.14	11.94	27	11.2 -12.4	11.59
	W*	-	-	-	27	6.4 - 7.3	6.73
	AW	5	6.26 - 6.81	6.66	-	-	-
	PW	5	6.03 - 6.93	6.60	-	-	-
M_5	L	4	10.96 -11.66	11.38	27	10.7 -12.2	11.46
	W*	-	-	-	26	5.9 - 7.0	6.33
	AW	4	5.99 - 6.68	6.38	-	-	-
	PW	4	5.00 - 5.94	5.52	-	-	-

rather elongate last molar for this specimen, more like that of *S. moornaensis* Crabb rather than an M_5 with a reduced talonid as in *S. laniarius* or *S. harrisii*. Its more horizontal, oblique anchorage and higher position than the other root tips supports this interpretation.

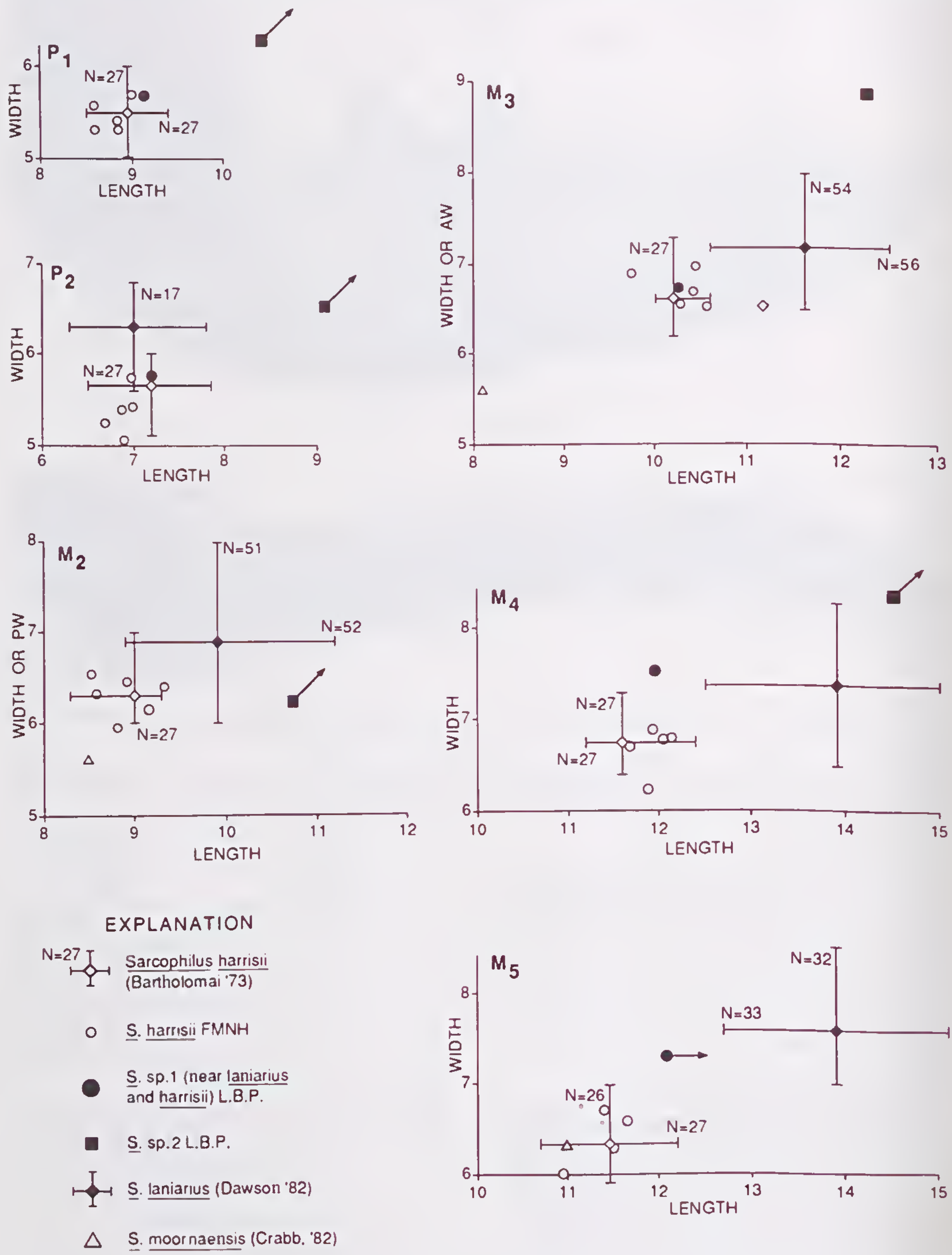

Fig. 3. Bivariate plots for each of the lower cheek teeth of the two LBP fossils, *Sarcophilus* sp. 1 (solid circle), and *S.* sp. 2 (solid square) and other species of the genus. Abscissa and ordinate scales are in mm. Means, ranges and sample sizes are indicated for samples greater than 1.

There is little surface bone left on the jaw; a small patch remains in the center of the lower half of the lingual side where a 2 mm thick bit remains. As a result the positions of the mental foramen and the masseteric concavity cannot be determined.

Discussion. This specimen has been compared with the following dasyurids: *Dasyurus viverinnus* (Shaw), *Dasyurops maculatus* (Kerr), *Glaucodon ballaratensis* Stirton, *Thylacinus cynocephalus* (Harris), *Sarcophilus harrisii* (Boitard) and *S. laniarius* Crabb. In the apparent slenderness of the ramus this specimen resembles *Thylacinus* Temminck and *Glaucodon* Stirton but in the crowding of the premolars and the massiveness of the molars it is more like *Sarcophilus*. This specimen is not assignable to any known species of *Sarcophilus*. It is similar

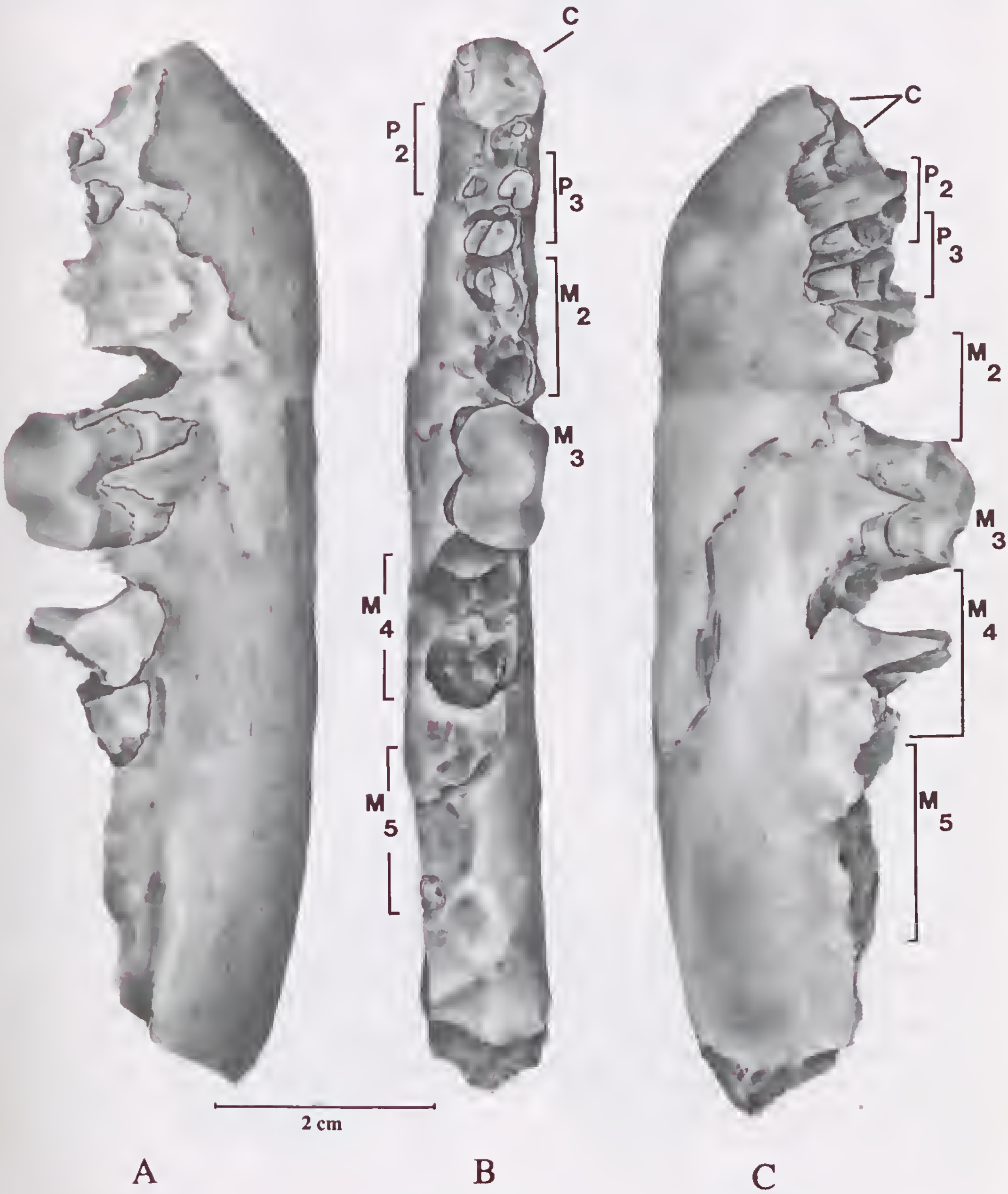

Fig. 4. *Sarcophilus* sp. 2, NMV P 23240, right ramus shown in: **A**, labial; **B**, occlusal; and **C**, lingual views. The specimen contains M_3 and roots and/or alveoli of the other teeth.

to, but larger than, *S. laniarius*. The extensive abrasion makes it impossible to determine its true proportions, but it appears to be more slender. The M_3 is more robust than in *Sarcophilus laniarius*.

Until recently, *S. laniarius*, which has been known only from late Pleistocene deposits, has been regarded as the ancestor of *S. harrisii* (Lydekker 1887; Ride 1964; Calaby and White 1966; Bartholomai and Marshall 1973). Dawson (1982) presented evidence from Wellington Caves materials that both validated the species *S. laniarius* and demonstrated its presence in late Pleistocene units older than had been recorded previously. The LBP sp. 1 specimen has a morphology intermediate between *S. harrisii* and *S. laniarius* and could be considered ancestral to both species. No morphological feature favors one notion of relationship over the other. The recognition by Crabb (1982) of *Sarcophilus moornaensis* from the Moorna Sands, considered to be early Pleistocene in age, further complicates the situation. The size of the dentition suggests that this species is decidedly smaller than either *S. harrisii* or *S. laniarius* and is much smaller than the LBP sp. 2 specimen.

In her study, Dawson (1982) reviewed the then known history of the late representatives of the genus *Sarcophilus*. She noted that in addition to *S. harrisii* and *S. laniarius*, at least one (perhaps more) much smaller unnamed species existed before about 20,000 years ago at Lakes Garnpung and Tandou, and at Dempsey's Lake. Further, she noted the presence of a large species of *Sarcophilus* (*S. laniarius*) at Lancefield and Buchan, also older than 20,000 BP. These new discoveries shed doubt on the dwarfing hypothesis (*S. laniarius-S. harrisii*) of Marshall (1973) and Marshall and Corruccini (1978).

The oldest record to date is of *S. moornaensis* reported by Crabb (1982) from the Moorna Sand estimated by him to be early Pleistocene in age or late Pliocene if the correlation of Woodburne *et al.* (1985) is accepted. Between this occurrence and the late Pleistocene to Recent record there is a very large temporal gap in *Sarcophilus* history. The LBP fossils appear to lie in this interval.

The presence of *Sarcophilus* sp. 2 in the LBP fauna adds a fourth species to the genus and further complicates the taxonomy. This is the largest species so far known. Dawson (1982) pointed out that temporal overlap of two species (a large one and a small) during the Pleistocene was possible but that no positive sympatry could be demonstrated. The presence of two species of *Sarcophilus* in the LBP Local Fauna is the first documented occurrence of two sympatric species (although not the same species pairs studied by Dawson). It is too early for a definite statement about the phylogenetic relationships of these taxa to be made. This must await the recovery of more material.

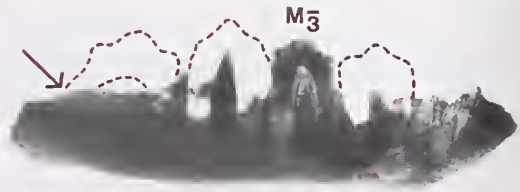

Fig. 5. *Sarcophilus* sp. 2, NMV P 23240, positive X-ray print of the right mandibular ramus showing the M_3 and roots of the other teeth. The dashed lines reconstruct the missing molars including the tip of the posterior root of M_5 (arrow).

Order DIPROTODONTA
Suborder VOMBATIFORMES
Family Vombatidae
Lasiorhinus cf. *medius* (Owen, 1872)
(Figs 6-8, Table 3)

Material. NMV P 14121, a well preserved pair of lower jaws with left and right incisors broken off near the alveolar edge, and with left M_{2-5}, right M_{3-5}.

Description. The P_3's, now lost as a result of breakage during preparation, appear to have been relatively large, judging by the swollen labial side of the left horizontal ramus and from a photograph taken by WDT in 1964 which shows that both premolars were present at that time (Fig. 8A). The ascending ramus of each is incomplete. Each lacks the moiety which extends from slightly above the level of the occlusal surface of the molars to the tip. Also missing are the condyles and the rear parts of the inflected angular processes.

The symphysis is long and deep, extending posteriorly to the area at the front of M_3. On the right ramus the deep masseteric fossa is well demarcated ventrally, anterodorsally and posteroventrally. At its deepest point an oval foramen, 5.5 mm x 4.0 mm, opens into the mandibular canal just ahead of the opening of the mandibular foramen on the medial side of the ramus where the broad inflected angle is preserved. The angular process forms an open, deep,

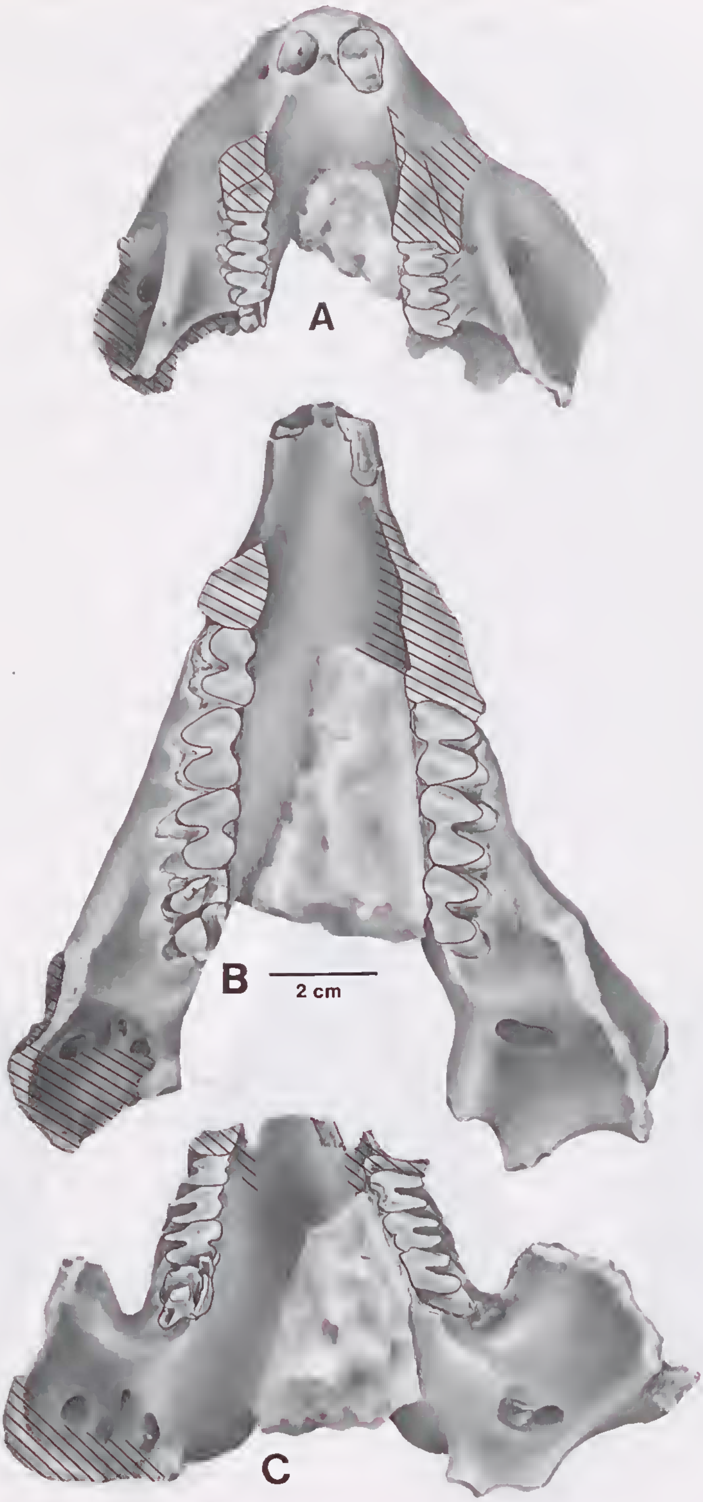

Fig. 6. *Lasiorhinus* cf. *L. medius* (Owen, 1872), mandible, NMV P 1412: **A**, 45° oblique view from the front showing incisors; **B**, dorsal (occlusal); and **C**, 45° oblique view from the back showing angular process and ascending ramus .

flat-bottomed pit for the insertion of the deep pterygoid muscle. The ventral margin of the horizontal ramus is convex downward and is evenly curved from the diastema to the angle. The labial side is slightly bulged but the lingual side is nearly flat, vertical and curves inwards towards the symphysis.

The lower incisors are broken away near the alveolar edge. They are oval in cross section at the break where they measure about 10.9 mm vertically by 7.3 mm horizontally (Figs 6A, 8C). On the left side at the break at the level between P_3 and M_2 the section of the incisors is also oval and of about the same dimensions. On the right side where the break passed between the M_2 and M_3 (Fig. 8B) the section seems to be more circular (9.2 x 7.4 mm).

The cheek teeth are columnar and open at their bases (Fig. 8B) which reach near to the bottom of the ramus. The M_2 has its oval posterior moiety broader than its more rounded anterior one. In the other molars the relative widths of the moieties are reversed, and the size discrepancy between the M_2 and M_{3-4} increases. M_5 is about the size of M_2, but its posterior moiety is much narrower. Mandibular and dental measurements are give in Table 3.

Discussion. McCoy (1876) and others, including Pritchard (1895), referred this specimen to *Phascolomys pliocenus* McCoy, 1874, a taxon that Wilkinson (1978) has shown to be a synonym of the living species *Vombatus hirsutus* (Perry). A number of workers have identified characters that distinguish various taxa of wombats. These have been reviewed in Dawson (1981, 1983a, 1983b). The characters tabulated by Dawson (1983b: Table 1) are used here with modification. The LBP specimen is similar to *Lasiorhinus medius* (Owen, 1872: Plate 34) in size and general morphology. It differs primarily in having somewhat larger molars, especially in the molar widths. Other size differences are many but minor (Table 3). The jaw in the LBP specimen is deeper under all teeth than Owen's specimen, except the M_5. The symphysis extends slightly farther back than in Owen's specimen, to the level of the anterior lobe of the M_3 rather than to the rear of the M_2. The junction of the rami where they join at the symphysis is more rounded. The LBP specimen is more similar to *Lasiorhinus medius* than to any other taxon of wombats and consequently we assign it to *Lasiorhinus* cf. *medius*. The ascending ramus appears to have been much like that of *Warendja wakefieldi* from McEachern's Cave (Hope and Wilkinson 1982) in that the angle "a" seems to have been between 50° and 60° and angle "b" is estimated to have been between 16° and 20°. The LBP specimen is

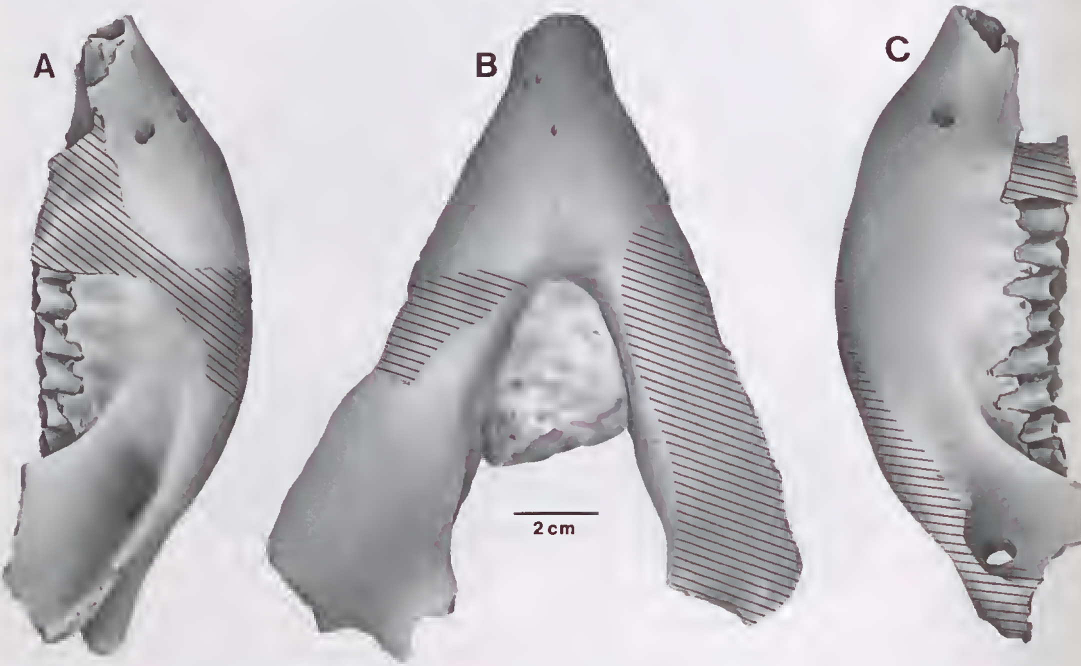

Fig.7. *Lasiorhinus* cf. *L. medius* (Owen, 1872), mandible, NMV P 14121: **A**, lateral; **B**, ventral views of right ramus; and **C**, lateral view of left ramus.

Table 3. Dental and mandibular measurements (mm) of *Lasiorhinus medius*, *Ramsayia (P.) magna* and *Ramsayia lemleyi*: [1] = dental measurements taken at wear surface whenever possible; [2] = measured on Owen (1872: Plate 34); [3] = data from Dawson, (1981); **b** = broken; ~ = estimate.

		Lasiorhinus cf *medius* NMV P 14121	*Lasiorhinus medius* Owen's Paratype[2]	*Ramsayia (P.) magna* QM F 834	QM F 7350	*Ramsayia lemleyi*[3] QM F 7819
P_3	L	-	8.4	20.0	17.0	18.5
	W	-	6.2	10.2	-	-
M_2	L	14.5	14.7	21.7	21.7	21.8
	AW	8.6	7.4	-	-	-
	PW	10.3	6.6	-	-	-
M_3	L	14.8	14.0	21.6	-	20.7
	AW	11.1	7.1	-	-	-
	PW	10.7	8.4	-	-	-
M_4	L	15.8	13.3	20.2	-	19.7
	AW	11.5	7.2	12.7	-	12.5
	PW	10.0	7.2	-	-	-
M_5	L	b 14.2	12.9	19.0	-	20.9
	AW	>8.1	6.4	11.5	-	10.8
	PW	7.2	6.0	-	-	8.3
Width of I_1		8.6	7.0	10.4	12.0	10.7
Depth of I_1		12.2	9.0	21.0	~24.0	22.7
Ratio W/D		0.7	0.8	0.5	0.5	0.5
P_3-M_5	L	-	61.7	107.0	-	107.9
M_2-M_5	L	58.8	53.4	-	-	-
Depth of jaw:						
below P_3		38.4	33.3	-	-	-
below M_2		>44.2	41.1	83.5	-	82.0
below M_{3-4}		-	45.1	80.0	-	78.0
below M_5		-	40.4	-	-	-
Diastema:						
length		~31.5	~25.5	-	-	-
depth I_1 alveolar		~19.1	~22.0	-	-	-

smaller than the other large wombats such as *Ramsayia magna* (Owen), *R. lemleyi* (Archer and Wade) and *Phascolonus gigas* (Owen).

Comparisons of the LBP specimen with modern *Lasiorhinus* Gray and *Vombatus* Geoffroy show that it resembles the former genus in the following ways:

1) the upper surface of the symphysis is flat and is bounded by low ridges,

2) the mental foramen is located away from the P_3,

3) the lower incisors are oval in cross section,

4) the pterygoid fossa is open, deep and not divided by a low ridge as in *Vombatus*,

5) the P_3 is subtriangular in cross section,

6) the maximum depth of the ramus is below M_3 and,

7) the posterior edge of the symphysis is more U shaped when viewed from below.

It resembles *Vombatus* in the depth of the masseteric fossa although the shape of the fossa is somewhat different. It is nearly 50% larger than either of the living taxa in the length of the cheek tooth row and 35% larger in the depth of the jaw. In general the LBP specimen and Owen's type of "*Phascolomys*" *medius* are more similar to *Lasiorhinus* than to *Vombatus* which Owen (1872) noted and which led Marcus (1976) to place Owen's taxon in *Lasiorhinus*.

Superfamily Macropodoidea
Family Macropodidae
Subfamily Macropodinae
***Macropus* Shaw, 1790**
***Macropus* (*Notomacropus*)**
[near *M. parryi* Bennett]
(Figs. 9-10, 11A-B, Table 4)

Material. NMV P 23220, a right horizontal ramus of a juvenile individual with broken incisor root, P_2, P_3 (now exposed by fenestration of the labial side of the ramus), M_{1-4}; NMV P 23280, a left horizontal ramus of an adult with P_3, M_{2-5}, originally associated with a long bone (possibly a metatarsal V of some large macropod).

Description. The juvenile specimen, NMV P 23220 (Fig. 9; Table 4), has a small P_2 with a bulbous crown with a low crest made up of three unequal cuspids. The anterior of these has weak labial and lingual ridges that extend down nearly to the crown base. The crest of the blade extends forward from this cuspid a short distance before bending sharply downwards and disappears as it approaches a small anterior cingular prominence at crown midheight. The central cuspid of the crest is the smallest, and it too has weak rounded labial and lingual ridges. The posterior cuspid is the largest and most bulbous of the three, and it causes the crest to curve lingually. There is no cingulum on the labial or posterior sides, and only weak ones on the anterior and lingual sides. The crest has wear facets on the labial side, especially each cuspid and its ridge. However, anterior progression of the cheek teeth has already advanced enough to have brought the P_2 forwards out of any functional occlusion. It is inclined downwards on the thin anterior slope of the sigmoid dorsal alveolar edge of the jaw while M_1 is situated atop that curve.

M_1 and M_2 are worn with the transverse lophids breached down to the level of the interloph valley. In M_1 this wear also breaches half of the forelink. The molars show a size gradient, $M_1<M_2<M_3<M_4$, and are elongate and

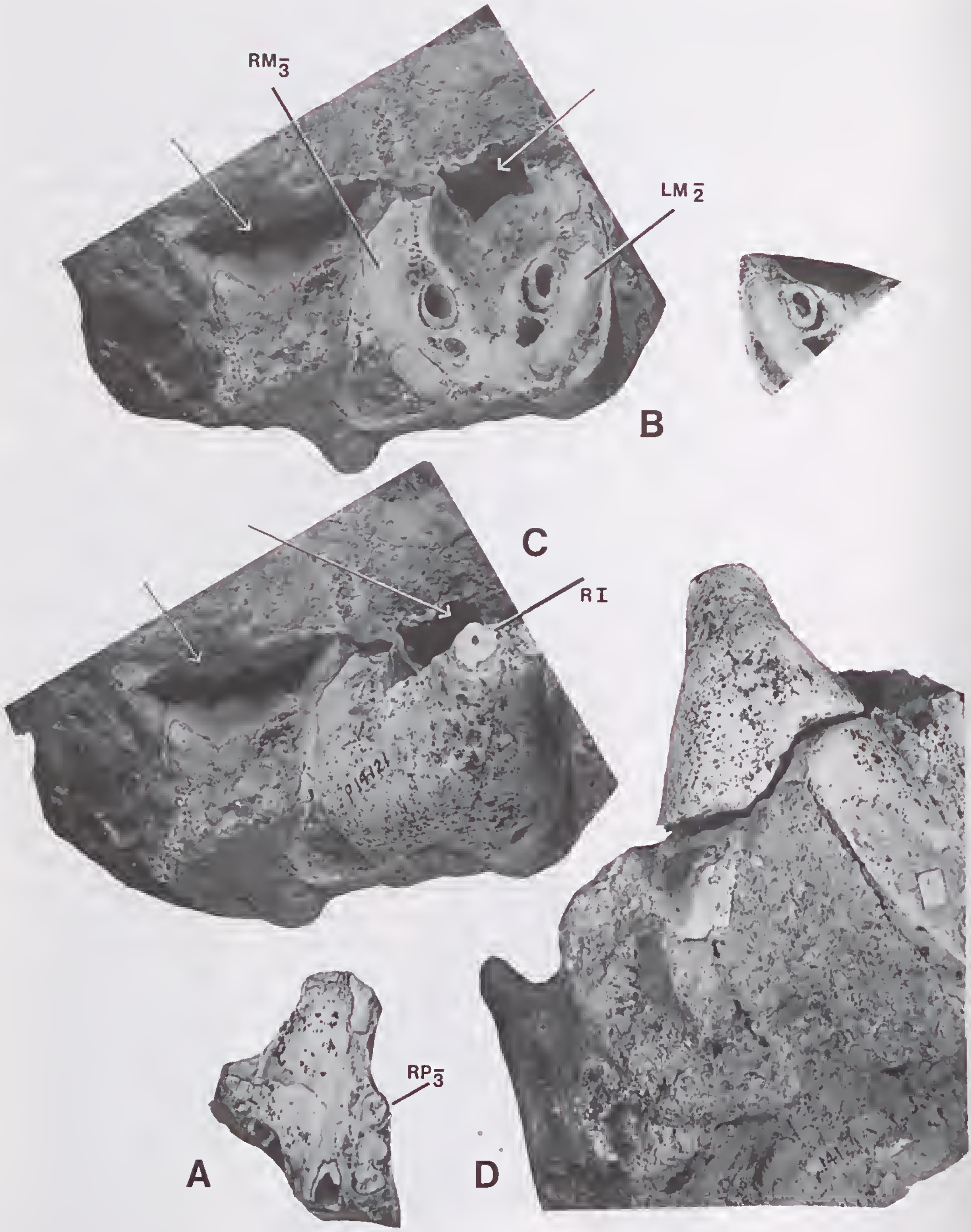

Fig. 8. Mandible of *Lasiorhinus* cf. *L. medius* (Owen, 1872) prior to preparation: **A**, dorsal view of symphyseal area showing P_3s and right M_2 prior to their loss during preparation; **B**, views of the major break, on the left looking posteriorly showing the "roots" of both incisors and most of the left M_2 and right M_3, and the calcite lined vug that overlaid the jaws and teeth (arrows). On the right looking anteriorly; **C**, the same as for the left side of (B), but with the symphyseal piece put into its position; **D**, ventral view of the jaws showing the major break.

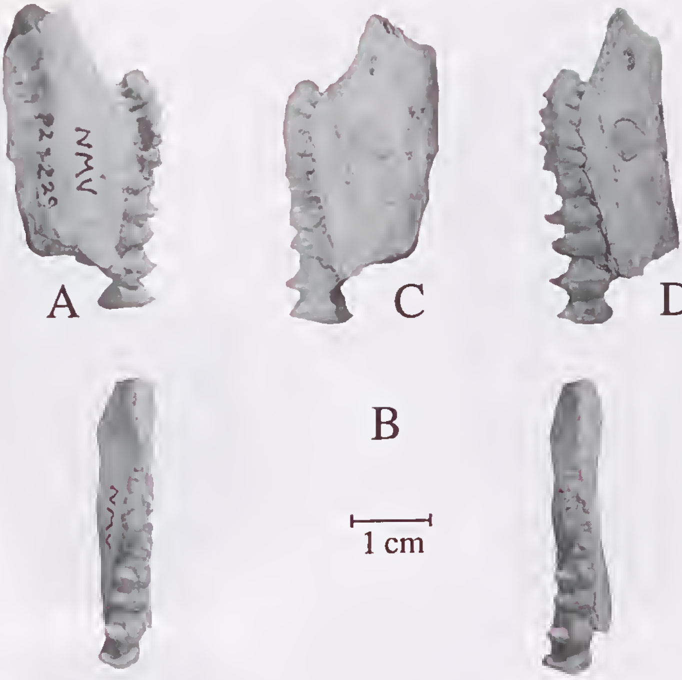

Fig. 9. *Macropus* (*Notomacropus*) near *M. parryi*. A juvenile right horizontal ramus (NMVP 23220): **A**, lingual; **B**, stereo-occlusal; **C**, labial; and **D**, dorso-labial views. The unerupted P_3 is shown in (C) and (D).

bunolophodont (Fig. 9, Table 4)) with pronounced broad procingulae. Cuspids and lophids are similar in each tooth and are of intermediate height. The lophids are only slightly convex posteriorly. Except for the M_1, in which the anterior lophid is narrow, the lophids of each tooth are subequal. Fore- and mid-links are distinct, the latter being high, and located just slightly labiad the midline of each tooth. No cingulum surrounds the teeth.

The replacement tooth, P_3, not clearly shown in the X-ray (Fig. 11B), now exposed labially in its crypt (Figs 9C, D), is very like the P_2 in both size and morphology, with a crest comprised of three cuspids which are more nearly equal to one another in size than those of the P_2. It has a rounded, weak cingulum labially which extends to an equally weak posterior cingular bulge, and anteriorly to a more substantial procingular one.

The dorsal edge of the horizontal ramus in addition to being sinuous, thins anteriorly, and a labial groove extends from the anterior end of the P_2 to the M_3. The mental foramen lies 5.5 mm ahead of P_2 (Fig. 9C), and the broken end of the fragment of the incisor "root" is located just beneath and ahead of the foramen. At the break the incisor measures 6.8 mm vertically by 4.5 mm horizontally. The ramus thickens both ventrally and posteriorly being 2.9 mm at the alveolar edge beneath P_2 and 7.2 mm just beneath the foramen, and 5.9 and 7.8 mm at the rear of M_3 at the alveolar edge and near the bottom of the ramus respectively. The ventral surface of the ramus is missing behind M_2, but the margin appears to have been nearly straight.

The adult specimen, NMV P 23280, is the most complete of the three LBP macropodid jaws (Figs 10, 11B) consisting of almost all of the ascending and horizontal rami. The horizontal ramus was broken (postmortem) between M_2 and M_3, the anterior portion being twisted down and labially. The ventral edge of the ramus appears to have been nearly straight for most of its length, but it is somewhat crushed and distorted. It is clear that the jaw was deepest beneath P_3-M_2 and shallower but thicker below and behind M_5. There is a very deep and elongated pterygoid fossa on the medial side of the inflected angular process (Fig. 10C) much like that of modern *Macropus irma* (Jourdan), but the posterior portion of the fossa and angular process could not be exposed without unduly risking the specimen. An X-ray (Fig. 11B) reveals details that can hardly be seen otherwise such as the condyle and the posterior edge from condyle to inflected

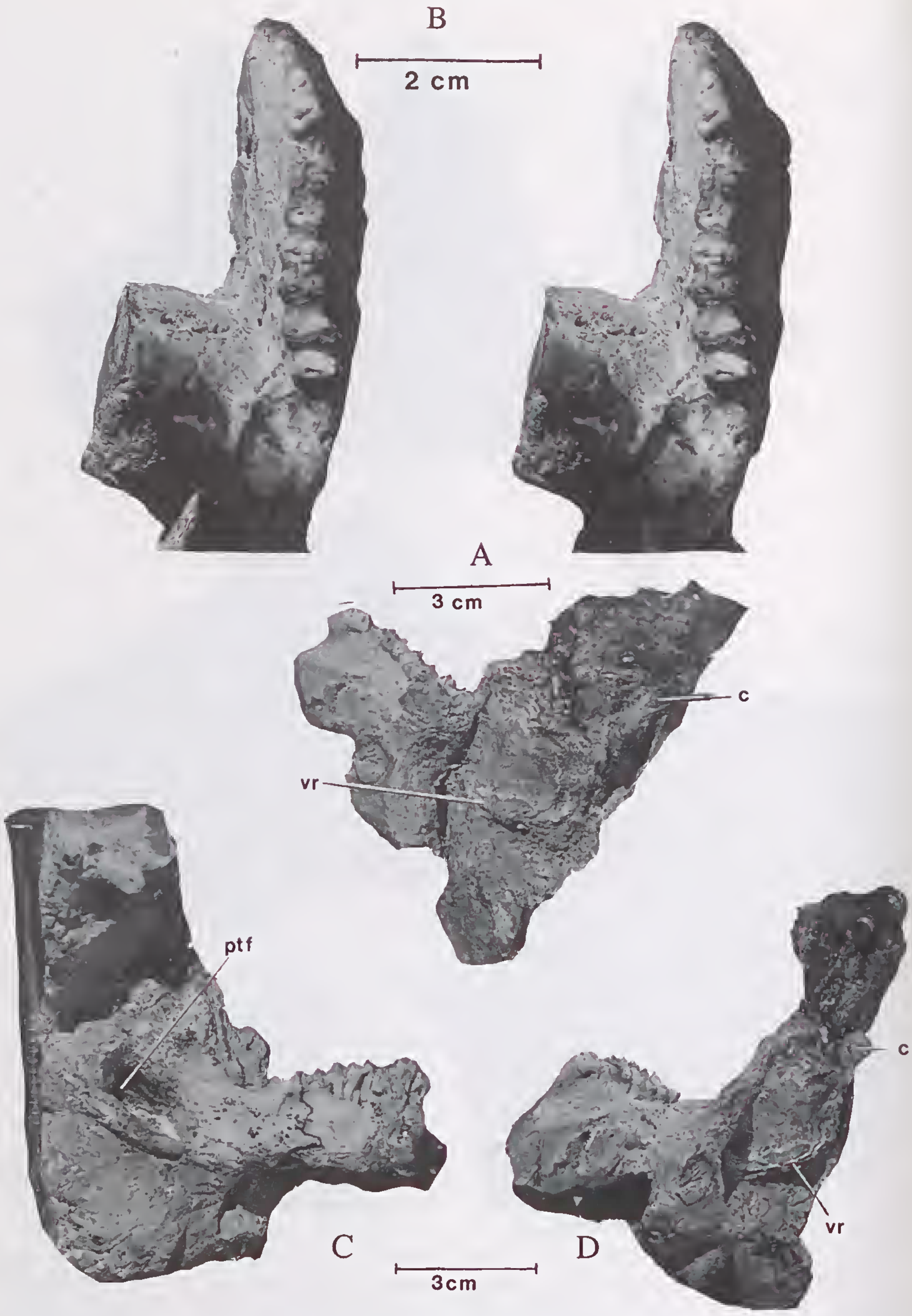

Fig. 10. *Macropus* (*Notomacropus*) near *M. parryi*. An adult left mandible, NMV P 23280: **A**, postero-dorso-lateral view of occlusal surface showing the condyle, and ventral ridge bordering the massseteric fossa ; **B**, stereo-occlusal view of the cheek teeth; **C**, lingual view of the mandible showing pterygoid fossa; **D**, oblique view of labial side showing the ventral ridge of the masseteric fossa and the edge of the condyle. Abbreviations: **c**, condyle; **vr**, ventral ridge; **ptf**, pterygoid fossa.

angular process. On the lateral side, preparation beneath the ventral rim of the masseteric fossa and within the fossa was not possible so only the crest of this rim is seen (Fig. 10A, C, D)

The condyle and most of the ascending ramus remain encased in matrix because of poor preservation of the bone in these areas. The medial edge of the condyle and its neck have been exposed where the external pterygoid muscle originates. Just ahead of this, the bone margin leading to the coronoid can be seen, and behind and below the condyle the posterior descending strut that supports the condyle and leads down to the angle is clear, especially in the X-ray (Fig. 11). The antero-posterior dimension of the masseteric fossa of the ascending ramus is relatively greater than is common in most wallabies (the distance from the vertical anterior edge of the ramus to the posterior edge of the strut beneath the condyle).

The P_3 is elongate and narrow in crown view. It has advanced and rotated forwards over the sigmoid hump of the alveolar edge of the jaw so that only its posterior cuspid shows a fresh wear facet: the other older facets are less distinct and sharp (Fig. 10 A, C, D). The tooth has a crest comprised of three cuspids. The anterior one is more rounded than the others and has blunt labial and lingual ridges, and there is an anterior cingular bulge at its base. It is separated from the central, smallest cuspid by a shallow U-shaped notch when viewed from the side. The middle cuspid has faint labial and lingual ridges that extend down to about midheight of the crown. The

Table 4. Dental measurements in mm of *Macropus*: **b** = broken; **w** = worn; **u** = unerupted; * = 3.5 subtracted for gap.

		Macropus parryi		*Macropus* cf. *parryi* LBP specimens		*Macropus irma*	*Macropus eugeni*
		FMNH 48301 Juvenile Left	FMNH 42090 Subadult Right	NMV P 23280 Adult Left	NMV P 23220 Juvenile Right	UT-TMM M2039 Adult Left	FMNH 49339 Adult Right
P_2	L	5.9	-	-	4.9	-	-
	AW	u ~2.5	-	-	2.4	-	-
	PW	3.1	-	-	2.5	-	-
P_3^L	L	-	5.6	5.2	-	4.6	3.8
	AW	-	2.1	2.2	-	2.5	2.0
	PW	-	2.5	2.5	-	2.4	2.0
M_1	L	6.4	-	-	6.0	-	-
	AW	4.0	-	-	3.4	-	-
	PW	4.5	-	-	4.1	-	-
M_2	L	u ~7.4	6.8	6.4	6.3	w 6.2	w 5.0
	AW	u >4.7	4.2	3.9	b 4.1	w 4.1	w 3.3
	PW	u >5.2	b >4.1	4.5	b 4.0	w 4.6	w 3.7
M_3	L	-	8.0	6.9	7.6	w 6.5	w 5.3
	AW	-	4.9	4.6	5.2	w 5.1	w 4.0
	PW	-	6.0	4.8	5.1	w 5.2	4.2
M_4	L	-	9.3	8.3	9.3	7.3	6.0
	AW	-	5.4	5.9	5.6	5.2	4.7
	PW	-	5.3	5.6	5.4	5.2	4.8
M_5	L	-	-	-	-	7.8	6.9
	AW	-	-	-	-	5.3	4.7
	PW	-	-	-	-	4.6	4.4
P_2-M_4	L	-	-	-	31.0	-	-
P_3-M_5	L	-	-	34.0*	-	31.2	w 24.8
M_{1-4}	L	-	-	-	28.0	-	-
M_{1-3}	L	-	-	-	19.1	-	-
M_{2-5}	L	-	-	31.6*	-	27.5	22.2
M_{2-4}	L	-	23.1	21.3*	22.9	19.2	16.1

posterior cuspid forms nearly half of the length of the crest which swings lingually at the rear of the tooth. Also at the rear the crest divides, the slightly greater part of its mass is located at the posterolabial corner, and the lesser, more pinched part descends towards a weak posterior cingular bulge. No cingulum is present labially and only weak rounded cingulae occur lingually, anteriorly and posteriorly.

The molars grade up in size from M_2 (M_2<M_3<M_4<M_5) and are essentially of the same form as described for the juvenile. The measurements are given in Table 4.

Discussion. Direct comparisons were made with modern wallaby genera using specimens in the Recent mammal collections of the Field Museum and the Texas Memorial Museum (Appendix). The closest match is with two *Macropus parryi* specimens, FMNH 48301 a juvenile, and 42090 a subadult. Next closest resemblance is to *M. eugenii* (Desmarest), FMNH 48105, 48370 both juveniles and 49339 an adult, and to an adult *Macropus irma*, TMM M-2039. Other similarities are seen with *Petrogale inornata*, FMNH 64352 a juvenile, and 64435 a subadult. Inspection of the DeVis type materials of *Halmaturus indra, siva, thor* and *odin* subsequently reported on by Bartholomai (1966, 1975, 1976) has allowed us to eliminate all of them from either this or the following taxon. Assignment to *Macropus*, near *M. parryi* is based on many close resemblances of dental and jaw features, most significantly the ratio of P_2 to P_3 lengths. The ratio of the P_2 of the juvenile and P_3 of the adult is 0.94. The ratio of the mean values of these two teeth in various species of *Macropus* is: *M. robustus* 0.872; *M. fuliginosus* (Desmarest) 1.02; *M. cangaru* 1.069; *M. antilopinus* 1.005; *M. eugenii*

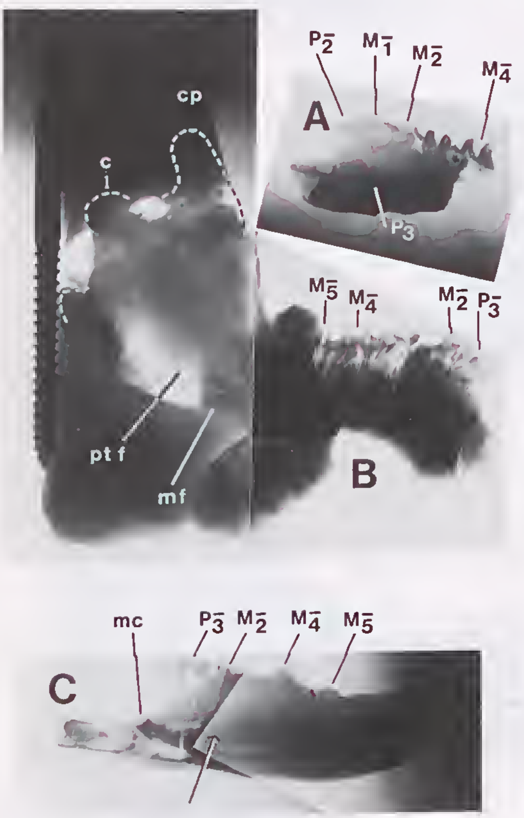

Fig. 11. Positive prints of X-ray photographs of the three wallaby specimens in the LBP Local Fauna: **A**, *Macropus (Notomacropus)* near *M. parryi*, NMV P 23220 . The faint shadow of P_3 can be seen; **B**, *Macropus (Notomacropus)* near *M. parryi*, NMV P 23280; **C**, *Wallabia* cf. *W. bicolor*, NMV P 23221. Left ramus, arrow indicates a feature that resembles a P_3; Abbreviations: **c**, condyle; **cp**, coronoid process; **mf**, masseteric fossa; **mc**, masseteric canal; **ptf**, pterygoid fossa.

Table 5. Dental measurements (mm) of *Wallabia bicolor*: **al** = alveolar; **u** = unerupted.

		LBP Specimen NMV P 23221 Adult Left	Recent Specimens FMNH 64365 Juvenile Left	FMNH 60892 Sub-adult Right	FMNH 64354 Adult Left	FMNH 48555 Subadult with pathology Right
P_2	L	-	5.6	-	-	6.1
	AW	-	2.6	-	-	2.9
	PW	-	2.7	-	-	3.5
P_3	L	7.5	-	7.5	7.8	u 7.4
	AW	2.7	-	2.3	2.3	u ~2.2
	PW	2.9	-	2.6	2.4	u
M_1	L	-	6.0	-	-	6.1
	AW	-	3.5	-	-	3.6
	PW	-	4.2	-	-	4.3
M_2	L	-	7.1	6.3	6.5	6.7
	AW	al 2.8	4.5	4.5	4.6	4.7
	PW	al 3.7	4.9	4.9	5.0	5.1
M_3	L	-	u ~8.0	7.3	7.2	7.5
	AW	al 3.2	5.5	5.3	5.3	5.5
	PW	al 3.6	u >5.6	5.5	5.5	5.6
M_4	L	-	-	8.7	8.2	8.8
	AW	al 3.4	-	6.0	6.1	5.9
	PW	al 4.3	-	5.9	6.2	5.7
M_5	L	-	-	u ~8.7	8.5	u >8.6
	AW	al 3.6	-	6.3	6.2	u >5.5
	PW	al 3.6	-	u ~5.6	6.1	u >4.9
P_2-M_4	L	-	-	-	-	32.9
P_3-M_5	L	~36.8	-	~36.2	36.2	~38.2
M_{1-4}	L	-	-	-	-	28.4
M_{1-3}	L	-	~20.4(R)	-	-	20.2
M_{2-5}	L	al 29.8	-	~29.4	29.0	~30.1
M_{2-4}	L	al 19.6	-	21.1	21.0	22.3

1.01; *M. parryi* 1.086. This ratio for *Thylogale* is: *T. billiardieri* (Desmarest) 0.752; *T. brunii* (Schreber) 0.710. Thus in this character the LBP specimens are closer to *Macropus* than to other genera of macropodids. The LBP specimens resemble *M. parryi* in the arched tooth row that is not so well marked in *M. eugenii*.

It is interesting and probably significant that another medial Pleistocene fauna, the Eastern Darling Downs, has a form, *M. thor* (De Vis), near the living *M. parryi* (Barthomai 1975). Using a log-difference diagram, Bartholomai has shown that *M. thor*, which is about 1/3 larger than *M. parryi*, has a greater correspondence to it than to either *M. rufogriseus* (Desmarest) or *M. dorsalis* (Gray). He concluded "cheek teeth in *M. thor* have more in common with those of *M. parryi* than with other wallabies, and it may be that these species are related". Now, in the medial to early late Pleistocene LBP fauna we have another wallaby similar to, if not conspecific with, *M. parryi*. However, in this case the fossil is about 10% smaller than the living form.

Wallabia Trouessart, 1905
Wallabia cf. *W. bicolor* (Desmarest, 1804)
(Figs 11C, 12; Table 5)

Materials. NMV P 23221, a left horizontal ramus with broken I_1 (root), P_3, the roots and alveoli of M_{2-5}, and the base of the buttress leading to the ascending ramus .

Description. Enough of the horizontal ramus is preserved to show these features:

1) the ventral margin is nearly straight,

2) the diastema is elongate, 21.0 mm from the front of the anterior root of P_3 to the approximate position of the incisor alveolar edge,

3) the mineralized fill of the canal shows that the mental foramen is single and that it exits about 8 mm ahead of the anterior edge of the P_3,

4) the lower incisor has an oval cross section at its broken surface (behind but near to the alveolar edge), being higher than wide (7.1 x 5.3 mm),

5) the dorsal edge of the ramus shows a typical macropodine sinuous upward anterior expansion, but the P_3 has not drifted out of occlusion and is well anchored in spite of considerable exposure of the top front of its anterior root,

6) there is a labial groove located very near to the alveolar margin that extends from beneath the P_3 to beneath M_3 where the ramus is broken, and

7) the ramus is rather massive ventrally with jaw depths being about 20.0 mm beneath P_3 and M_1 and 17.3 beneath M_4.

The P_3 of NMV P 23221 is heavily worn, especially posteriorly. Its longitudinal crest, a pinched blade, has four cuspids. The anterior and posterior ones are the larger two, the former is almost twinned by an anterior extension that carries the crest forwards onto the front edge of the tooth to a bulge in its base, and then on down to a small anterior cingular prominence. The posterior cuspid is weakly bifid posteriorly, the lingual side being the posterior end of the blade. Its apex is separated from the more anterior part

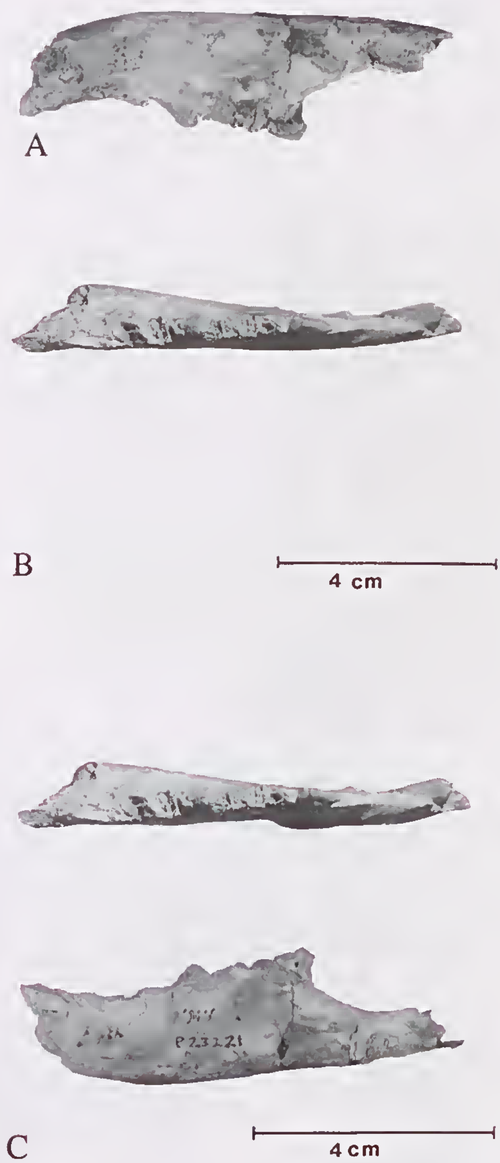

Fig. 12. *Wallabia* cf. *W. bicolor*, NMV P 23221: **A**, labial; **B**, stereo-occlusal; and **C**, lingual views.

of the crest by a cleft which has been nearly eliminated by wear, but which is still discernible in occlusal, lingual and labial views. The two intermediate cuspids are small, especially the anterior one which has sharper, but short labial and lingual ridges. There is a weak, variably developed cingulum extending around the tooth base except for the rear of the tooth where it disappears.

The molars are missing and only alveolar dimensions can be obtained (Table 5). They were about the same size as those of the other LBP species whose P_3 is a much smaller tooth.

Discussion. This LBP specimen closely resembles modern specimens of *W. bicolor* in the Field Museum collection, particularly FMNH 60892 and 64354. The former is a subadult with the M_5 erupting, the latter with M_5 showing slight wear. These two modern specimens show variation within the species in the form of the P_3s. The LBP specimen resembles the subadult more closely in that both show a clefted condition of the rear of the crest, just anterior to the posterior cuspid. The young adult and the fossil, partly because of greater wear, are closer in overall slenderness. However, the modern specimen lacks the deep cleft in the crest and its posterior cuspid is less prominent than in either the other modern, or the LBP specimens.

The narrow raised sigmoid curve of the alveolar edge of the jaw is higher in the fossil than in the two modern specimens, and the labial groove is much higher and closer to the jaw margin. We attribute all of these differences to the different age stages represented, and if aligned from youngest to oldest, the groove is seen to migrate upwards with increasing age. In spite of the incomplete nature of this specimen, the characters of the one tooth and jaw and tooth proportions (alveolar) correspond more closely to *Wallabia bicolor* than to any other taxon we examined.

As with *Macropus parryi*, the LBP fauna has another taxon that is close to, if not conspecific with, a modern species, *Wallabia bicolor*. *Wallabia indra* (De Vis) from the Eastern Darling Downs, seems to belong to the *W. bicolor* lineage but differs in size from the modern species (Bartholomai 1976). As with the *M. parryi* material, the LBP specimen of *W. bicolor* is about 1/3 smaller than the material of *W. indra* from the Darling Downs. The closer size similarity of both taxa to their modern counterparts than to the Darling Downs material suggests a younger age for the LBP fauna.

Subfamily Sthenurinae ✓
***Simosthenurus* Tedford, 1966**
***Simosthenurus mccoyi* n. sp.**
(Figs 13-15, Table 6)

Type material. HOLOTYPE: NMV P 23271-2, pair of lower jaws with left and right P_3-M_5.

Additional material: NMV P 23238-9, right ramus with broken P_3, M_2 and M_{3-5} (Fig. 14, Table

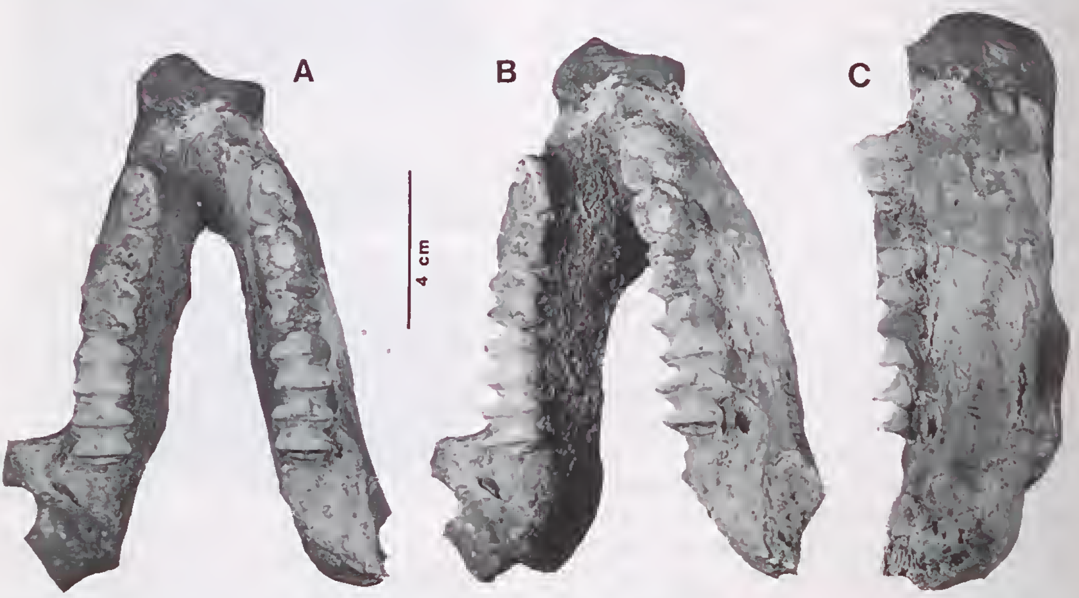

Fig. 13. *Simosthenurus mccoyi* n. sp. holotype, NMV P 23271-2: **A**, occlusal; **B**, right dorso-lateral oblique views; and **C**, labial view of right ramus.

Table 6. Dental and mandibular measurements (mm) of specimens assigned to *Simosthenurus*: **b** = broken; # = undesignated position; **r** = root measurement; * = measurement made on epoxy cast of natural mold; w = worn.

		Simosthenurus mccoyi LBP sp. nov.			*Simosthenurus oreas* De Vis Holotype		*Simosthenurus pales* de Vis (*Halmaturus*) Krefft			*Simosthenurus orientalis* Holotype		
		NMV P 23371-2		NMV P 23238-9	QM F2923 (Bartholomai 1963)		QM F812	AM 41521 (Bartholomai 1963)	AM 19653 (Tedford 1963)	AM F102201	BMNH 40001 (Tedford 1966)	AM MF912
		Left	Right	Right	Left	Right						
P_3	L	16.2	16.2	r 18.4	12.3	12.6	-	19.6	18.8	17.0	17.0	-
	AW	9.5	9.8	r 7.8	-	-	-	9.0	9.3	7.9	8.2	-
	PW	~11.4*	12.4	r 9.2	-	7.5	-	10.1	10.9	10.7	9.3	-
M_2	L	w 13.6	w 13.2	-	12.7	12.6	18.5	16.4	17.0	14.0	12.1	-
	AW	~14.1*	>12.7	r 10.6	-	-	-	-	12.8	10.9	9.7	-
	PW	~13.9*	~13.7*	r~11.3	9.2	9.1	-	-	13.2	11.2	10.0	-
M_3	L	16.1	16.2	16.6	14.6	14.5	21.0	18.9	-	15.0	13.7	14.3
	AW	15.9	>15.9	b 12.2	-	-	-	14.9	-	12.2	11.0	-
	PW	15.2	15.1*	b 13.8	10.8	10.7	17.5#	14.8	-	12.7	11.2	11.8
M_4	L	17.4	17.4	17.8	15.8	15.5	22.4	19.4	-	15.2	16.4	15.3
	AW	16.6	15.8*	15.5	12.0	11.7	-	16.0	-	13.0	12.2	12.3
	PW	15.5	15.5	b 14.5	-	-	-	15.8	-	13.2	12.1	12.6
M_5	L	17.2	17.3	16.9	14.8	14.9	-	18.1	-	14.6	-	-
	AW	16.4	16.4	15.2	11.6	11.6	-	16.0	-	12.7	-	-
	PW	14.6	14.7	13.7	-	-	-	14.2	-	12.1	-	-
P_3-M_5	L	79.5	80.2	-	30.8	31.2	-	-	-	-	-	-
M_2-M_5	L	62.4	62.6	-	20.4	-	-	-	-	-	-	-
M_2-M_4	L	47.2	47.2	-	-	-	-	-	-	-	-	-

6). NMV P 23284, a right maxillary fragment consisting of the lateral wall of the bone in the area of the roots of the check teeth (Fig. 15). The teeth are broken away obliquely; from approximately the lingual alveolar border to the labial base of the crown. Portions of the roots of the cheek teeth can be seen. An approximate alveolar length of the molar series is 54 mm.

Diagnosis. Intermediate in size between *S. orientalis* (Tedford) and *S. pales* (De Vis). Differs from these and all other species of the genus in that P_3 is short relative to the lengths of M_{3-5} being equalled or exceeded in length by each of these molars, P_3 is wider for its length (77% of length), and the lower molars are nearly equidimensional in occlusal outline with their anterior widths 95-98% of length.

Description. These two well preserved specimens appear to belong to the same taxon. Dental measurements are given in Table 6, and although specimen P 23238-9 has suffered damage, making accurate width measurements of the molars and the lengths of the P_3 and M_2 impossible, it is possible to obtain reasonable measures for both lophids of M_4 and M_5. The massiveness and depth of the ramus show that this specimen is comparable to the more complete type specimen, P 23271-2. The dimensions of the right mandibular rami of these two specimens are: NMV P23271-2, depth anterior to P_3 30.0 mm, depth beneath M_5 >>28.0 mm, thickness beneath P_3 24.9 mm, thickness posterior to M_4 29.0 mm; NMV P23238-9, depth posterior to P_3 35.4 mm, depth beneath M_5 42.3 mm, thickness beneath P_3 19.1 mm, posterior to M_4 23.7 mm. In the type specimen the P_3s are worn so that their posterior moieties are truncated with near-circular dentine "lakes" exposed.

The molars (M_{2-5}) are subequal in bulk. In the M_2s all crown features are gone leaving dentine "lakes" with only very slight enamel surrounds. In the M_3s the transverse lophids are truncated by wear, but their form has not been erased, and the midlink, although breached, is still a raised feature, its bulk largely intact. The M_4s and M_5s are both only slightly worn, each has a slight beveled wear facet extending across the width on the posterior side of each lophid. The lophids are straight and both fore-and midlinks are present. There is a strong tendency for the links to be comprised of a double ridge, and, in the case of the forelink, several more enamel wrinkles par-

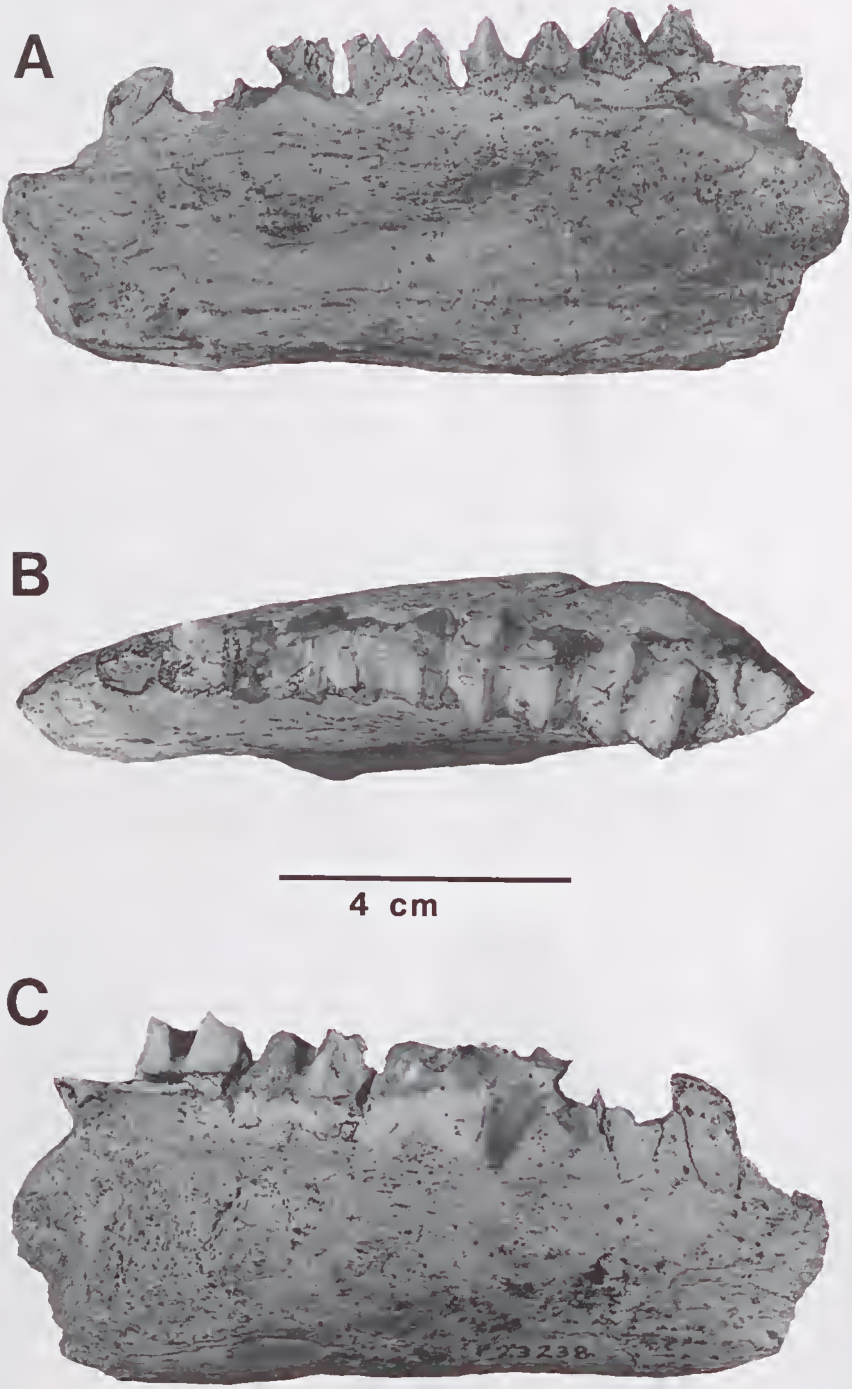

Fig. 14. *Simosthenurus mccoyi* n. sp., referred specimen, NMV P 23238-9, right horizontal ramus: **A**, labial; **B**, occlusal; and **C**, lingual views.

allel the link on the anterior face of the protolophid. Specimen P 23238-9 is at a slightly younger wear/age stage than the type specimen in that the crown of its M_3 shows a lesser degree of dentine exposure. Its protolophid is breached and the dentine exposure extends forwards along the forelink, but does not quite reach to the anterior border of the anterior cingulum. The enamel of the hypolophid has only been slightly breached, mostly on the postero-lateral edge of the crest at the hypoconid, and the midlink has not been involved at all. The crenulate ornamentation of the anterior faces of both lophids of M_4 and M_5 and the hypolophid of M_3 all show a somewhat greater degree of development than is seen in the type.

In the tentatively referred maxillary, the boss of the zygomatic process for attachment of the superfical masseter muscle descends steeply downwards, nearly vertically in front (Fig. 15C). There is a broad, open, relatively deep, anteriorly facing concavity anterior to this boss but no sign of the infraorbital foramen which would be expected to be located just ahead of the anterior edge of the preserved part of the specimen if it were in its usual position. The process itself is stout, tapers to a blunt point, and is set off 13 mm from the lateral wall of the maxillary. The bone of the anterior part of the dorso-ventrally expanded zygomatic arch thins rapidly behind the process. In all of these features sthenurine proportions are seen, since the size is about right we tentatively assign it to the new species, *S. mccoyi*.

Discussion. The LBP specimens differ from other species of the genus *Simosthenurus* in the following ways: the ratio of the length to posterior width of the P_3 crown in NMV P 23271-2 is larger (0.77) than in any other described species. The crown of P_3 is shorter relative to molar length, being equaled or exceeded by M_4 and M_5, rather than longer than all molars. Only the smaller *S. oreas* (De Vis) has a similar proportional relationship. In addition, the proportion of the length to anterior width of the M_{3-5} is within the range 0.95-0.98, much closer to equidimensional than in other *Simosthenurus* in which the anterior molar width is usually 70-80% of length. In absolute length the LBP specimens have tooth dimensions intermediate between *S. orientalis* and *S. pales*. The posterolabial ridge of P_3 joins the lingual ridge near the midlength, a distinct groove marking the junction, more like the condition in *S. orientalis* than in other taxa.

The lower molars have anteriorly short anterior cinguli, low but well developed links with an

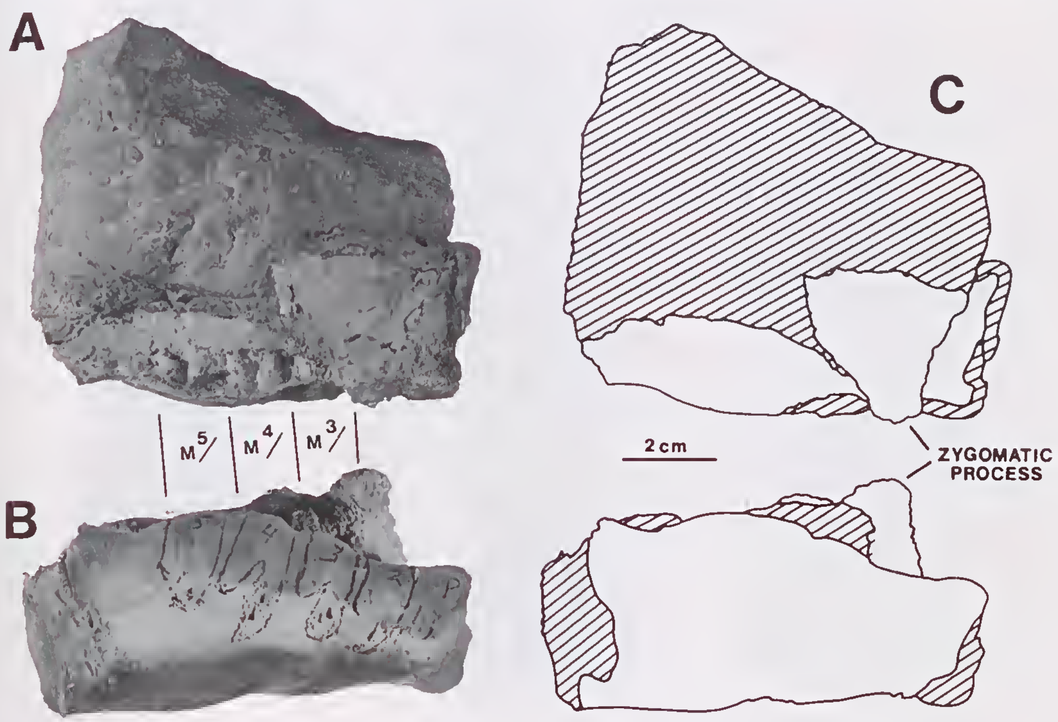

Fig. 15. *Simosthenurus mccoyi* n. sp., referred specimen, NMV P 23284, right maxillary fragment: **A**, lateral; **B**, ventral views; and **C**, an explanatory outline drawing of (A) and (B).

additional midlink, lophid crenulations are numerous and strong, especially lingual to the links, and the posterior cingulum forms a weak shelf. There is a mandibular foramen beneath the posterior root of M_3, shown on NMV P 23238-9, and a shallow mandibular groove extending from beneath P_3 postero-ventrally to end in a pit beneath M_2. The mental foramen lies well forward of the anterior root of P_3 and is inclined at about 45°.

The combination of size and proportional relationships of the dentition marks this as an unique taxon. The morphological features have resemblances to other species of *Simosthenurus*, but the combination in this taxon has not been recorded so far.

Etymology. Named for F. McCoy, pioneer paleontologist of Victoria, who first described fossils from Limeburner's Point.

Macropodidae
Genus and species indet.
(Fig. 16)

Material. NMV P 23241, right ramus with nearly all tooth material and compact bone lost, but with alveoli or root remnants of $?I_1$, $?P_3$, M_{2-5}. NMV P 23295, a ?right ramus fragment with parts of roots of M_{4-5} or a maxillary fragment with the impressions of the lingual side of the last two upper molars.

Description. Specimen NMV P 23241 has totally lost its external bone, and almost all of its dentition. There is no trace of any compact surface bone, or tooth enamel or dentine of the tooth crowns (Fig. 16A, C). There is left only the internal bone material and partial tooth roots or alveoli, similar to the mode of preservation seen in some specimens from Coimadai (Turnbull *et al.* 1990).

Discussion. From its overall size and proportions the specimen appears to be from a sthenurine macropodid but the wasted ramus appears to be far too shallow for that to be the case, or for it to be a *Macropus*. Perhaps it is a *Protemnodon* Owen.

Family Diprotodontidae
Subfamily Diprotodontinae
***Diprotodon* cf. *D. optatum* Owen, 1838**
***Diprotodon longiceps* McCoy, 1865**
***Diprotodon longiceps* Keble, 1945**
(Fig. 17, Table 7)

Material. NMV P 13003 (and including one piece with the number P 2327_, probably 23277),

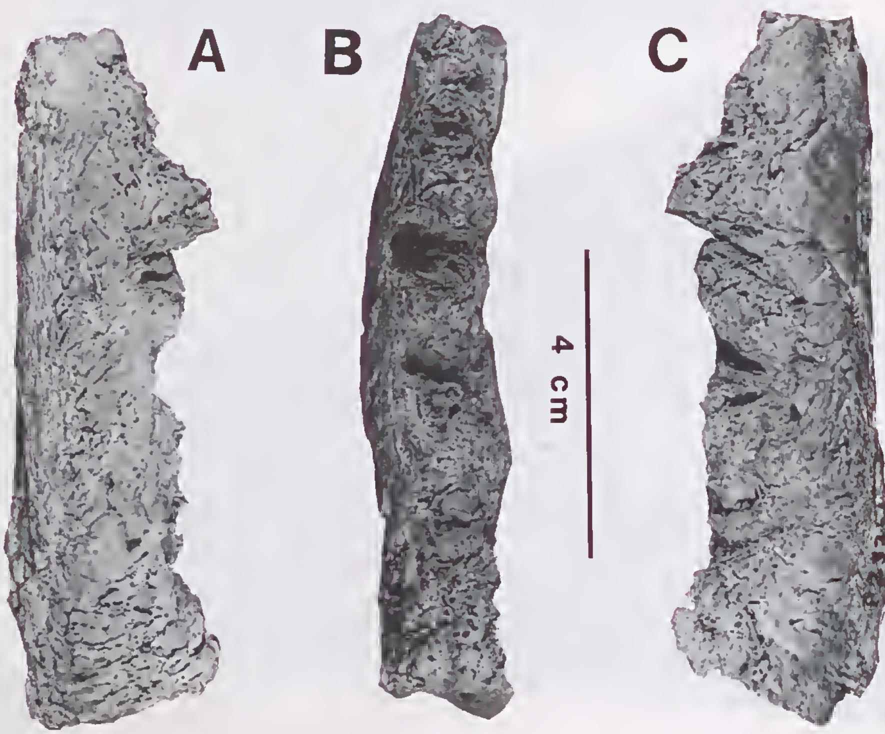

Fig. 16. Indeterminate macropodid left mandibular ramus, NMV P 23241: **A**, labial; **B**, dorsal; and **C**, lingual views. This specimen shows the unusual preservation seen in many of the Coimadai specimens.

Fig. 17. *Diprotodon* cf. *D. optatum*, NMV P 13003 in palatal view.

palate with left and right P^3-M^5 and alveoli of the I^2s and I^3s. Keble (1945) erroneously listed the specimen identified by McCoy (1876) as No 13303 when 13003 had been intended. It was originally in six pieces and could only be seen in sections along the breaks, the palate and teeth being covered by five or more centimeters of limestone. This must have been the condition when McCoy examined it. All of the pieces but one (P 2327_) bore the number 13003, none of them had the number 13303. (T. Rich has verified 13003 as the correct number).

Description. The zygomatic process of the maxillary faces laterally and is located dorsal to the posterior root of M^4. The specimen shows the narrow anterior extension of the maxillary under the premaxillary. The alveolus for the right I^2 can be seen at the anterior end of the specimen just ahead of the presumed premaxillary-maxillary suture. Nowhere else can this suture be positively identified. The alveolus of the left I^2 is broken about 2 cm behind the anterior edge of the alveolar opening, to judge by that of the right I^2. The premaxillary is broken away on the left side to expose nearly two cm of the root of the I^3. At this point the remnant of the root is approximately parallel to the long axis of the premaxillary. Just anterior to this the alveolus

Fig. 18. *Zygomaturus* sp., NMV P 23235, 23242, edentulous mandibular rami: **A**, dorsal; **B**, lateral view of left ramus; and **C**, lingual view of right ramus.

turns outward about 15°. Part of the root of the right I^3 is exposed in a window on the ventral side of the palate near its narrowest point. The antero-posterior diameter of the alveolus for the right I^3 is 18.3 mm, its transverse diameter is 14.8 mm. What little remains of the poorly preserved palate seems to indicate that its posterior edges extended at least as far back as the rear of the M^4s.

The left P^3 is almost complete. It has the "horse shoe" crown morphology characteristic of *Diprotodon* (Stirton *et al.* 1967; Archer 1977) with distinct paracone and metacone, each joined to the protocone by a crest. A prominent ridge extends from the apex of the metacone to its base and forms the posterolingual corner of the tooth. There is no posterior cingulum. Breakage makes it impossible to determine whether or not there was an anterior cingulum.

The upper molars are bilophodont. The anterior loph is shorter than the posterior one on M^2, about equal to it on M^3, and longer on M^{4-5}. Prominent anterior cinguli are present on all molars. The posterior loph of M^4 and both lophs of M^5 are convex anteriorly. Each end of the posterior face of the anterior lophs of M^{2-3} has a low rounded ridge that extends into the interloph valley. On the M^4 there is a broad bulge comparable to labial ridges on the M^{2-3}. On M^5 the condition is more like the condition on M^2. The enamel shows the punctate surface formed by fine crenulations mentioned by Archer (1977). Tooth dimensions are given in Table 7.

Discussion. This well preserved specimen was unprepared at the time McCoy (1876) referred it to his *D. longiceps* (McCoy 1865). The crowns of the cheek teeth are now revealed and these closely resemble in size and shape comparable teeth in the *D. optatum* Owen sample from Lake Callabonna. There seems no reason to refer this material to *D. longiceps* if that is indeed a valid taxon.

Subfamily Zygomaturinae
Zygomaturus sp.
(Figs 18-19, Table 7)

Material. Mandible (Fig. 18) consisting of left ramus (Fig. 18B) with alveoli of M_{3-4} and roots of M_5 (NMV P 23235 along with 23244, 23246, 23248-9, 23258, 23261-3 and 23266) and right ramus (Fig. 18C) including left and right symphyseal fragments and the partial alveoli of right I_1, P_{2-3}, $M_{2,4-5}$ and left M_{3-5} (NMV P 23242 along with 23245, 23247, and one piece with its number lost [buried] in the assembly). NMV P 23243, left ramus fragment with roots of M_{4-5} (Fig. 19), probably same taxon as P 23235 and 23242 (Table 7). Missing numbers incorporated into one of the composites, most likely the pair of jaws of the *Zygomaturus* sp. specimen shown in Figure 17, without being recorded: NMV P 23254, 23264-5, 23277, 23289.

Description. Both of these rami have only the alveoli of M_{3-4} and some of the crown base of the M_5 (Fig. 18, Table 7). These poorly preserved fragments clearly pertain to a small diprotodontid, one that is most similar to *Zygomaturus* Macleay in size and what remains of the morphology. The ends of the oval incisor alveoli extend backwards beneath the M_2, the end of the symphysis to level of the posterior root of M_3, the inferior border of the horizontal ramus is strongly convex, and the anterior edge of the ascending ramus lies behind M_5 in NMV P 23235/P23242. In P 23243, presumably the younger specimen, the anterior edge of the ascending ramus lies labiad the posterior root of M_5. These features together are typical of *Zygomaturus*. A form the size of *Z. trilobus* Macleay or *Z. victoriae* is indicated by the dimensions of the roots of the M_5.

Table 7. Measurements (mm) of the Limeburner's Point diprotodontids: b = broken.

		Diprotodon cf. *optatum* NMV P 13003		*Zygomaturus* sp. NMV P 23235/23242		NMV P23243
		Left	Right	Left	Right	
P^3	L	26.0	b			
	AW	20.2	b			
	PW	25.4	24.3			
M^2	L	35.5	37.9			
	AW	b>33.5	35.4			
	PW	b>38.6	40.1			
M^3	L	46.6	40.9			
	AW	b>38.0	42.6			
	PW	b>44.7	43.6			
M^4	L	52.1	54.8			
	AW	b>44.4	50.4			
	PW	b>43.9	45.7			
M^5	L	b	54.6			
	AW	b>43.7	49.2			
	PW	-	b>40.5			
Symphysis	L			-	>80.0	-
Ramus	L			>145.0	~143.0	-
Ramus depth: symphysis rear				>55.0	-	-
beneath M_5				98.0	>86.0	72.0
M_4 alveolar	L			~48.0	-	~46.0
M_5 alveolar	L			~44.0	~44.0	45.0

CONCLUSIONS

The LBP Local Fauna, collected mostly in the late 1880's from freshwater limestones, consists of nine taxa, all of which except two macropodids represent populations differing from known late Pleistocene to Recent species in significant ways. Six belong to extinct lineages. This strongly suggests a greater age, probably mid to early-late Pleistocene, for the fauna. This is in agreement with recent paleomagnetic data (Whitelaw, 1991; in press) wherein the strata containing the LBP Local Fauna were determined to be from one of the two normal polarity intervals younger than 1.66 Ma, either 0.98-0.91 Ma or 0.73 Ma. Unfortunately we have no firm basis for determining which of the two is the most likely. It seems most likely that the present normal (Brunhes) chron is involved, as the LBP Local Fauna is composed of seven genera, three of which are common in better known late Pleistocene assemblages, with the distinctions being confined to the species level. In addition the small macropodid species seem most similar to living forms, further supporting a later Pleistocene age.

The Limeburner's Point Local Fauna consists of nine taxa comprising four species of macropodids, one *Macropus* near *M. parryi*, *Wallabia* cf. *W. bicolor*, a new sthenurine, *Simosthenurus mccoyi* , and an indeterminate large macropodid. There is one new large wombat that differs from, but is most similar to, *Lasiorhinus medius* (Owen). Two taxa of diprotodonts are represented, *Diprotodon "longiceps"* of McCoy which we believe is best referred to *D. optatum* since it is similar to the

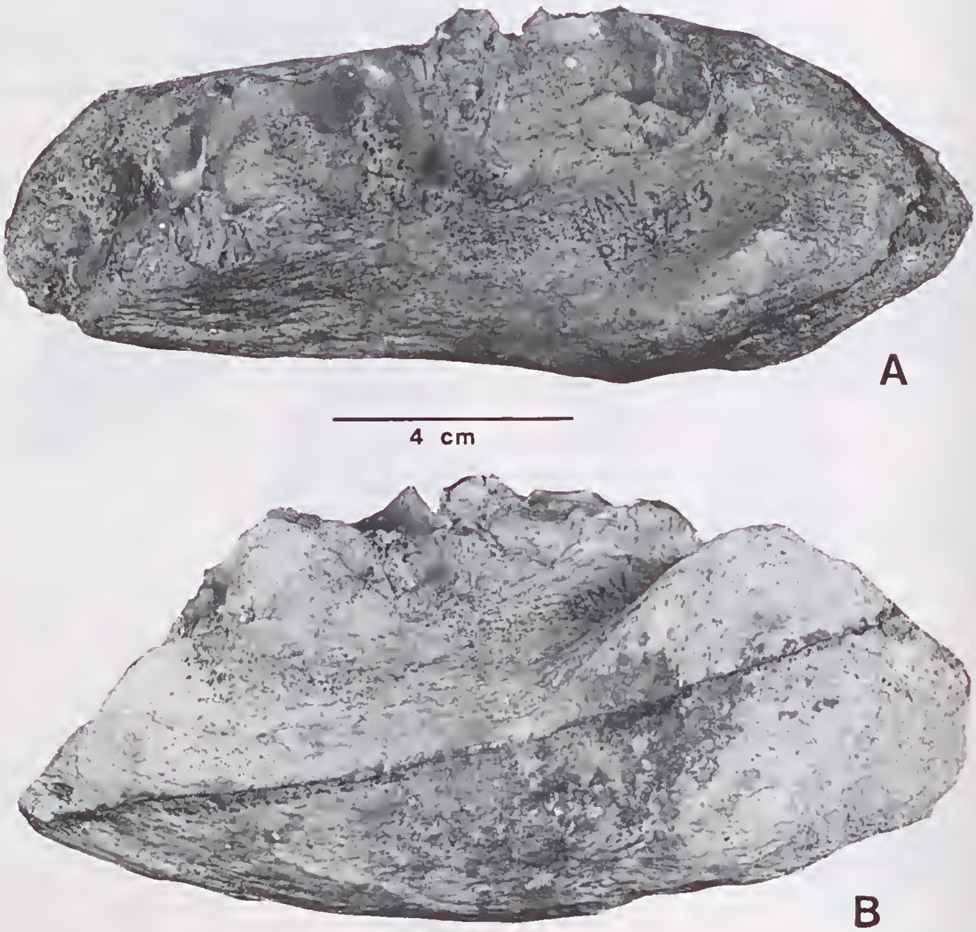

Fig. 19. *Zygomaturus* sp. NMV P 23243, left ramus fragment in: A, dorsal and B, lateral views.

Lake Callabonna sample of mid-Pleistocene age. The other is a *Zygomaturus* about the size of *Z. trilobus* or *Z. victoriae*. Finally there are two carnivorous forms both referable to *Sarcophilus*. One of these (sp. 1) is near to both modern *S. harrisii* and the extinct late-Pleistocene *S. laniarius*, and could be ancestral to both. The other (sp. 2) is decidedly different from any known sarcophiline species, being larger and of different proportions and morphology.

A lacustrine environment of deposition is indicated by the enclosing matrix of limestone with freshwater mollusks. Most of the fossils appear to be isolated pieces, but there is evidence for some partial articulation and also of trampling. Preservation is mostly fairly good, but the matrix is hard and tough and the bone is soft and fragile. The specimens from the more rubbly limestone units show poorer preservation similar to that of the Coimadai Fauna.

With such a small sample of taxa, comparisons to other mid to early late Pleistocene or later faunas are difficult. However the generic composition of the fauna agrees best with Pleistocene assemblages rather than Pliocene ones in accord with the stratigraphic evidence. Dated local faunas of this type are few, but the Duck Ponds Local Fauna, which is older than the LBP Local Fauna, possibly in the late Matuyama Chron, also contains taxa common to later Pleistocene assemblages. Evidence accumulated to date indicates rather uniform generic composition of Australian marsupial faunas during the time of rapid cycling of world climate (0.73-0 Ma).

ACKNOWLEDGEMENTS

We thank the following people for assistance in preparing this report. The late Edmund Gill, of the Museum of Victoria made the Limeburner's Point specimens available to us for study. William Simpson and John Harris of the Field Museum of Natural History and Robert H. Rainey of the University of Texas assisted in the preparation of the specimens. Zbigniew Jastrzebski and Tamani Orzechowski prepared the illustrations. We thank M. J. Whitelaw and *Quaternary Research* for permission to reproduce Figure 1. The work was supported by National Science Foundation Grant GB 975, the Field Museum and the Geology Foundation of the University of Texas at Austin. We also thank Judith Lundelius for editorial assistance and Hedy Turnbull for assistance in many ways.

REFERENCES

Archer, M. 1977. Origins and subfamilial relationships of *Diprotodon* (Diprotodontidae, Marsupialia). *Memoirs of the Queensland Museum* **18**(1): 37-39.

Archer, M. 1978. The nature of the molar-premolar boundary in marsupials and a reinterpretation of the homology of marsupial cheekteeth. *Memoirs of the Queensland Museum* **18**(2): 157-164.

Aziz-ur-Rahman and McDougall, I. 1972. Potassium-Argon ages on the newer volcanics of Victoria. *Proceedings of the Royal Society of Victoria* **85**(1): 61-69.

Bartholomai, A. 1963. Revision of the extinct macropodid genus *Sthenurus* in Queensland. *Memoirs of the Queensland Museum* **14**(3): 51-76.

Bartholomai, A. 1966. The type specimens of DeVis' species of fossil Macropodidae. *Memoirs of the Queensland Museum* **14**(5): 115-126.

Bartholomai, A. 1975. The genus *Macropus* Shaw (Marsupialia: Macropodidae) in the upper Cainozoic deposits of Queensland. *Memoirs of the Queensland Museum* **17**: 195-235.

Bartholomai, A. 1976. The genus *Wallabia* Trouessart (Marsupialia: Macropodidae) in the upper Cainozoic deposits of Queensland. *Memoirs of the Queensland Museum* **17**: 373-377.

Bartholomai, A. and Marshall, L. G. 1973. The identity of the supposed dasyurid Marsupial, *Sarcophilus prior* DeVis, 1883, with comments on other reported 'Pliocene' occurrences of *Sarcophilus*. *Memoirs of the Queensland Museum* **16**(3): 369-374.

Boitard, M. P. 1841, "1842". *Pantheon Populaire. Le Jardin des Plantes*. G. Barba, Paris: Roc 1 Lockwood and Son: New York. 204 pp.

Calaby, J. H. and White, C. 1966. The Tasmanian Devil, *Sarcophilus harrisii*, in northern Australia in Recent times. *Australian Journal of Science* **29**: 473-475.

Crabb, P. 1982. Pleistocene dasyurids (Marsupialia) from southwestern New South Wales. In: Archer, M. (ed.) *Carnivorous Marsupials. Vol 2*. Pp. 511-516. Royal Zoological Society of New South Wales: Sydney.

Daintree, R. 1863. Geological Survey of Victoria Quarter Sheet 24 NE. In: *Report on the geology of the district from Bacchus Marsh to Bass Strait*. Public Lands Circular 1863, reprinted 1897.

Dawson, L. 1981. The status of the taxa of extinct giant wombats (Vombatidae: Marsupialia) and a consideration of vombatid phylogeny. *Australian Mammalogy* **4**: 65-79.

Dawson, L. 1982. Taxonomic status of fossil devils (*Sarcophilus*, Dasyuridae, Marsupialia) from Late Quaternary eastern Australian localities. In: Archer, M. (ed.).*Carnivorous Marsupials. Vol.*

2. Pp 517-525. Royal Zoological Society of New South Wales: Sydney.

Dawson, L. 1983a. On the uncertain generic status and phylogenetic relationships of the large extinct vombatid species *Phascolomys medius* Owen, 1982 (Marsupialia: Vombatidae). *Australian Mammalogy* **6**(1): 65-79.

Dawson, L. 1983b. The taxonomic status of small fossil wombats (Vombatidae: Marsupialia) from Quaternary deposits, and of related modern wombats. *Proceedings of the Linnean Society of New South Wales* **107**(2): 101-23.

Demarest, A. G. 1804. Appliquée aux arts, principalement à l'économie rurale et domestique: par une société de naturalistes et d'argiculteurs: avec des figures tirées des trois règnes de la nature. *Nouveau dictionnaire d'histoire naturelle applique aux arts.* **1a edicion,** XII (1803): 357, Paris.

Flannery, T. F. and Hope, J. H. 1983. Occurrences of the extinct macropodid marsupial *Simosthenurus maddocki* in New South Wales. *Australian Mammalogy* **6**: 37-39.

Gill, E. D. 1964. Rocks contiguous with the Basaltic Cuirass of Western Victoria. Basalt Plains Symposium, Melbourne, Victoria: *Proceedings of the Royal Society of Victoria* **12**: 331-355.

Glauert, L. 1910. The Mammoth Cave. *Records of the Western Australian Museum and Art Gallery* **1**:11-36.

Hope, J. and Wilkinson, H. E. 1982. *Warendja wakefieldi* a new genus of wombat (Marsupialia, Vombatidae) from Pleistocene sediments of McEacherns Cave, Western Victoria. *Memoirs of the National Museum of Victoria* **43**: 109-121.

Keble, R. A. 1945. The stratigraphical range and habitat of the Diprotodontidae in southern Australia. *Proceedings of the Royal Society of Victoria* **57** NS: 23-48.

Lydekker, R. 1887. *Catalogue of fossil mammals in the British Museum (Nat. Hist.) Pt. V Marsupialia.* Taylor and Francis, London. i-xvi, 1-345pp.

McCoy, F. 1865. On the bones of a new gigantic marsupial. *Proceedings of the Royal Society of Victoria* **6**: 25.

McCoy, F. 1874. *Prodromus of the Palaeontology of Victoria, Decade 1. Phascolomys pliocenus* (McCoy). Pp 21-22, pls. III-V. Geological Survey of Victoria.

McCoy, F. 1876. *Prodromus of the Palaeontology of Victoria. Decade IV. Diprotodon longiceps (McCoy), Nototherium.* Pp 7-11, pls. XXXI-XXXIII. Geological Survey of Victoria.

Marcus, L. 1976. The Bingara Fauna. *University of California Publications in Geological Sciences* **114**: i-iv, 1-145.

Marshall, L. G. 1973. Fossil vertebrate faunas from the Lake Victoria region, S. W. New South Wales, Australia. *Memoirs of the National Museum of Victoria* **34**: 151-172.

Marshall, L. G. and Corruccini, R. S. 1978. Variability, evolutionary rates, and allometry in dwarfing lineages. *Paleobiology* **4**(2): 101-119.

Merrilees, D. 1967. Cranial and mandibular characters of modern mainland wombats from a palaeontological viewpoint and their bearing on the fossils called *Phascolomys parvus* by Owen, 1872. *Records of the South Australian Museum* **15**(3): 399-418.

Owen, R. 1838. Fossil remains from Wellington Valley, Australia. In: *Three expeditions into the interior of eastern Australia, with descriptions of the recently explored region of Australia Felix and of the present colony of New South Wales. Volume 2.* Pp 359-363. T. L. Mitchell: London.

Owen, R. 1872. On the fossil mammals of Australia, Part VII. Genus *Phascolomys*: species exceeding the existing ones in size. *Philosophical Transactions of the Royal Society of London* **162**: 251-258.

Pritchard, G. B. 1895. Notes on the freshwater limestones of the Geelong District. *The Geelong Naturalist* **4**: 37-40.

Ride, W. D. L., 1964. A review of Australian marsupials. *Royal Society of Western Australia* **47**: 97-131.

Shaw, G.. 1790. *The Naturalist's Miscellany.* London.

Stirton, R. A. 1957. Tertiary marsupials from Victoria. *Memoirs of the National Museum of Victoria* **21**: 121-34.

Stirton, R. A., Tedford, R. H. and Woodburne, M. O. 1967. A new Tertiary formation and fauna from the Tirari Desert, South Australia. *Records of the South Australian Museum* **15**: 427-462.

Tedford, R. H. 1966. A review of the macropodid genus *Sthenurus. University of California Publications in Geological Sciences* **57**: 1-72.

Trouessart, E. L. 1905. *Catalogus Mammalium tem viventium quam fossilium. Quinquennale supplementum (1899-1904), Fasc. IV, Cetacea, Edentata, Marsupialia, Allotheria, Monotremata.* Pp 753-873. R. Friedlander & Son: Berlin.

Turnbull, W. D., Lundelius, Jr., E. L. and Tedford, R. H. 1990. Fossil mammals of the Coimadai Local Fauna near Bacchus Marsh, Victoria. *Memoirs of the Queensland Museum* **28**(1): 223-245.

Whitelaw, M. J. 1991. Magnetic polarity stratigraphy of Pliocene and Pleistocene fossil vertebrate localities in southeastern Australia. *Bulletin of the Geological Society of America* **103**(11): 1493-1503.

Whitelaw, M. J. (in press). Age constraints on the Duck Ponds and Limeburner's Point mammalian faunas based on magnetic polarity stratigraphy in the Geelong area (Victoria), Australia. *Quaternary Research.*

Wilkinson, H. E. 1972. The Duck Ponds fossil marsupial fauna. Hovell's Creek, Lara, Victoria, Australia. *Memoirs of the National Museum of Victoria* **33**: 41-46.

Wilkinson, H. E. 1978. Synonomy of the fossil wombat *Vombatus pliocenus* McCoy with the living species *Vombatus hirsutus* (Perry). *Memoirs of the National Museum of Victoria* **39**: 93-100.

Woodburne, M. O., Tedford, R. H., Archer, M., Turnbull, W. D., Plane, M. and Lundelius, Jr, E. L. 1985. Biochronology of the continental mammal record of Australia and New Guinea. *South Australian Department of Mines and Energy, Special Publication* **5**: 347-363.

APPENDIX

Materials of extant macropodids examined in comparison with the LBP specimens assigned to *Macropus* near *M. parryi* and *Wallabia* cf. *bicolor*.

Dendrolagus	*goodfellowi*	FMNH 60238
		FMNH 104954
Dorcopsis	*hageni*	FMNH 31859
		FMNH 31860
	luctuosa	FMNH 8379
	mulleri	FMNH 104613
		FMNH 108014
Macropus	*eugenii*	FMNH 4810
		FMNH 48370
		FMNH 49339
	irma	UT TMM-M 2039
Macropus	*parryi*	FMNH 42090
		FMNH 48301
	rufogrisea	FMNH 58961
	sp.	FMNH 44874
	(juv. of *M. rufus* or *M. robustus*)	
Petrogale	*inornata*	FMNH 64352
		FMNH 64435
Setonyx	*brachyurus*	FMNH 67712
		FMNH 98787
Thylogale	*billiardieri*	FMNH 57798
		FMNH 98911
	brunii keyseri	FMNH 34207
		FMNH 60682
	brunii brownii	FMNH 31864
	brunii stigmatica	FMNH 60777
		FMNH 60885
		FMNH 60886
		FMNH 64356
	sp.	AMNH 198047
Wallabia	*bicolor*	FMNH 64354
		FMNH 64365
		FMNH 64855
	bicolor apicalis	FMNH 60892
	bicolor bicolor	FMNH 48555

Accepted 24 August, 1992